Glencoe Mathematics

Nastering the TAKs

Texas Assessment of Knowledge and Skills

Grade 10

Diagnose Prescribe Practice Benchmark



Test-Taking Tips

- Go to bed early the night before the test. You will think more clearly after a good night's rest.
- Read each problem carefully, and think about ways to solve the problem before you try to answer the question.
- Relax. Most people get nervous when taking a test. It's natural. Just do your best.
- Answer questions that you are sure about first. If you do not know the answer to a question, skip it and go back to that question later.
- Think positively. Some problems may seem hard to you, but you may be able to figure out what to do if you read each question carefully.
- If no figure is provided, draw one. If one is furnished, mark it in any way that will help you solve the problem.
- When you have finished each problem, reread it to make sure that your answer is reasonable.
- Become familiar with a variety of formulas and when they should be used.
- Make sure that the number of the question on the answer sheet matches the number of the question on which you are working in your test booklet.



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Road Map to TAKS Success An Annotated Table of Contents-Checkpoint Ahead Steps to Success Page(s) **Diagnose** Your Needs Learn what mathematics skills are assessed on the TAKS. Texas Essential Knowledge and Skills, Grade 10vi-ix Take the Diagnostic Test first. Record your mastered skills. Student Recording Chart for TAKS Masteryv If you made a perfect score on your Diagnostic Test, proceed to Step 3 on the next page. Reteaching Mastery Prescribe Ways to Improve Your Skills Use the information from your student Recording Sheet to determine which TAKS Practice pages you need to complete. Functional Relationships.....11

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Road Map to TAKS Success An Annotated Table of Contents—

Practice

Master

Page(s)

Steps to Success



Practice Your Test Skills

Take the Practice Test to determine how you have improved your mathematics skills.

Approximately 25 weeks before your test date, begin the Countdown to TAKS. This contains problems that are similar to those found on the TAKS.

Work on the problems for each day unless your teacher instructs you to do otherwise. Each question tells which objective is being assessed.



Benchmark Your Progress

Monitor your progress as the year progresses by taking the Benchmark Tests. You can record your progress with each test.

Mastery of Objectives Chartx

Each Benchmark Test assesses the same concepts but is taken at a different time during the school year. Your test scores should improve with each test taken.

Benchmark Test 1 (take in late October)	. 106–117
Benchmark Test 2 (take in early January)	.118–129
Benchmark Test 3 (take in early February)	.130–141



Student Recording Chart

Directions Mark a ✓ by each question from the Diagnostic Test that you answer *correctly*. If there are more than one or two questions not marked for a benchmark, write *Yes* in the *Need Practice?* box. Then complete the practice pages for that benchmark.

TEKS	A.1(A)	A.1(B)	A.1(C)	A.1(D)	A.1(E)	A.2(A)	A.2(B)	A.2(C)	A.3(A)
TAKS Objective	1	1	1	1	1	2	2	3	2
Test Questions	13 🗆	1 🗆	5 🗆	4 🗆	26 🗆	10 🗆	21 🗆	30 🗆	36 🗆
Need Practice?									
Practice Pages	11	12	13	14	15	16	17	18	20
TEKS	A.3(B)	A.4(A)	A.4(B)	A.5(A)	A.5(C)	A.6(A)	A.6(B)	A.6(C)	A.6(D)
TAKS Objective	2	2	2	3	3	3	3	3	3
Test Questions	38 🗆	49 🗆	46 🗆	51 🗆	44 🗆	55 🗆	56 🗆	53 🗆	47 🗆
Need Practice?									
Practice Pages	21	22	23	24	25	26	27	28	29
TEKS	A.6(E)	A.6(G)	A.7(A)	A.7(B)	A.7(C)	A.8(A)	A.8(B)	A.9(B)	A.9(C)
TAKS Objective	3	3	4	4	4	4	4	5	5
Test Questions	14 🗆	7 🗆	3 🗆	27 🗆	16 🗆	40 🗆	33 🗆	8 🗆	18 🗆
Need Practice?									
Practice Pages	30	32	33	34	35	36	37	39	40
TEKS	A.9(D)	A.10(A)	A.10(B)	A.11(A)	8.3(B)	8.6(A)	8.6(B)	8.7(A)	8.7(B)
TAKS Objective	5	5	5	5	9	6	6	D	7
Test Questions	41 🗆	52 🗆	45 🗆	28 🗆	17 🗆	11 🗆	29 🗆	34 🗆	22 🗆
Need Practice?									
Practice Pages	41	42	43	44	58	45	46	48	49
TEKS	8.7(C)	8.7(D)	8.8(A)	8.8(B)	8.8(C)	8.9(A)	8.9(B)	8.10(A)	8.10(B)
TAKS Objective	7	6	8	8	8	8	8	8	8
Test Questions	6 🗆	15 🗆	54 🗆	9 🗆	24 🗆	32 🗆	12 🗆	39 🗆	23 🗆
Need Practice?									
Practice Pages	50	47	51	52	53	54	55	56	57
TEKS	8.11(A)	8.11(B)	8.12(A)	8.13(B)	8.14(A)	8.14(B)	8.14(C)	8.15(A)	8.16(A)
TAKS Objective	9	9	9	9	10	10	10	10	10
Test Questions	42 🗆	48 🗆	31 🗆	37 🗆	43 🗆	50 🗆	20 🗆	35 🗆	19 🗆
Need Practice?									
Practice Pages	59	60	61	63	64	65	66	67	68

TEKS	8.16(B)
TAKS Objective	10
Test Questions	25 🗆
Need Practice?	
Practice Pages	69

Texas Essential Knowledge and Skills for Mathematics, Geometry

	Texas Essential Knowledge and Skills				
(B) K	NOWLEDGE AND SKILLS.				
(G.1) The s stude	GEOMETRIC STRUCTURE. student understands the structure of, and relationships within, an axiomatic system. The ent is expected to:				
(A)	develop an awareness of the structure of a mathematical system, connecting definitions, postulates, logical reasoning, and theorems;				
(B)	recognize the historical development of geometric systems and know mathematics is developed for a variety of purposes; and				
(C)	compare and contrast the structures and implications of Euclidean and non-Euclidean geometries.				
(G.2) The s stude	GEOMETRIC STRUCTURE. student analyzes geometric relationships in order to make and verify conjectures. The ent is expected to:				
(A)	use constructions to explore attributes of geometric figures and to make conjectures about geometric relationships; and				
(B)	make conjectures about angles, lines, polygons, circles, and three-dimensional figures and determine the validity of the conjectures, choosing from a variety of approaches such as coordinate, transformational, or axiomatic.				
(G.3) The s stude	GEOMETRIC STRUCTURE. student applies logical reasoning to justify and prove mathematical statements. The ent is expected to:				
(A)	determine the validity of a conditional statement, its converse, inverse, and contrapositive;				
(B)	construct and justify statements about geometric figures and their properties;				
(C)	(C) use logical reasoning to prove statements are true and find counter examples to disprove statements that are false;				
(D)	use inductive reasoning to formulate a conjecture; and				
(E)	use deductive reasoning to prove a statement.				
(G.4) The s solve picto	GEOMETRIC STRUCTURE. Student uses a variety of representations to describe geometric relationships and problems. The student is expected to select an appropriate representation (concrete, rial, graphical, verbal, or symbolic) in order to solve problems.				

	Texas Essential Knowledge and Skills
(G.5) The s probl	GEOMETRIC PATTERNS. Student uses a variety of representations to describe geometric relationships and solve tems. The student is expected to:
(A)	use numeric and geometric patterns to develop algebraic expressions representing geometric properties;
(B)	use numeric and geometric patterns to make generalizations about geometric properties, including properties of polygons, ratios in similar figures and solids, and angle relationships in polygons and circles;
(C)	use properties of transformations and their compositions to make connections between mathematics and the real world, such as tessellations; and
(D)	identify and apply patterns from right triangles to solve meaningful problems, including special right triangles (45-45-90 and 30-60-90) and triangles whose sides are Pythagorean triples.
(G.6) The s relate The s	DIMENSIONALITY AND THE GEOMETRY OF LOCATION. Student analyzes the relationship between three-dimensional geometric figures and ed two-dimensional representations and uses these representations to solve problems. Student is expected to:
(A)	describe and draw the intersection of a given plane with various three-dimensional geometric figures;
(B)	use nets to represent and construct three-dimensional geometric figures; and
(C)	use orthographic and isometric views of three-dimensional geometric figures to represent and construct three-dimensional geometric figures and solve problems.
(G.7) The s repre	DIMENSIONALITY AND THE GEOMETRY OF LOCATION. Student understands that coordinate systems provide convenient and efficient ways of senting geometric figures and uses them accordingly. The student is expected to:
(A)	use one- and two-dimensional coordinate systems to represent points, lines, rays, line segments, and figures;
(B)	use slopes and equations of lines to investigate geometric relationships, including parallel lines, perpendicular lines, and special segments of triangles and other polygons; and
(C)	derive and use formulas involving length, slope, and midpoint.

	Texas Essential Knowledge and Skills
(G.8) The s meas stude	CONGRUENCE AND THE GEOMETRY OF SIZE. student use tools to determine measurements of geometric figures and extends surement concepts to find perimeter, area, and volume in problem situations. The ent is expected to:
(A)	find areas of regular polygons, circles, and composite figures;
(B)	find areas of sectors and arc lengths of circles using proportional reasoning;
(C)	derive, extend, and use the Pythagorean Theorem; and
(D)	find surface areas and volumes of prisms, pyramids, spheres, cones, cylinders, and composites of these figures in problem situations.
(G.9) The s stude	CONGRUENCE AND THE GEOMETRY OF SIZE. student analyzes properties and describes relationships in geometric figures. The ent is expected to:
(A)	formulate and test conjectures about the properties of parallel and perpendicular lines based on explorations and concrete models;
(B)	formulate and test conjectures about the properties and attributes of polygons and their component parts based on explorations and concrete models;
(C)	formulate and test conjectures about the properties and attributes of circles and the lines that intersect them based on explorations and concrete models; and
(D)	analyze the characteristics of polyhedra and other three-dimensional figures and their component parts based on explorations and concrete models.
(G.10 The s probl) CONGRUENCE AND THE GEOMETRY OF SIZE. student applies the concept of congruence to justify properties of figures and solve ems. The student is expected to:
(A)	use congruence transformations to make conjectures and justify properties of geometric figures including figures represented on a coordinate plane; and
(B)	justify and apply triangle congruence relationships.
(G.11 The s probl) SIMILARITY AND THE GEOMETRY OF SHAPE. student applies the concepts of similarity to justify properties of figures and solve ems. The student is expected to:
(A)	use and extend similarity properties and transformations to explore and justify conjectures about geometric figures;
(B)	use ratios to solve problems involving similar figures;
(C)	develop, apply, and justify triangle similarity relationships, such as right triangle ratios, trigonometric ratios, and Pythagorean triples using a variety of methods; and
(D)	describe the effect on perimeter, area, and volume when one or more dimensions of a figure are changed and apply this idea in solving problems.

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Mastery of Objectives Chart



Directions Mark a \checkmark by each question from the Benchmark Test that you answer *correctly*. The goal is to gain more \checkmark s with each Benchmark Test you take.

		Test 1			Test 2			Test 3		
Strand	Date:			Date:			Date:			
Objective 1	Questio	ns:		Questic	ons:		Questic	ons:		
	□ 1 □ 33	□ 37 □ 41	□ 48	□ 1 □ 33	□ 37 □ 41	□ 48	□ 1 □ 33	□ 37 □ 41	□ 48	
Objective 2	Questio	ns:		Questic	ons:		Questic	Questions:		
	□ 9 □ 21 □ 38	□ 45 □ 47 □ 49	□ 53 □ 59	□ 9 □ 21 □ 38	□ 45 □ 47 □ 49	□ 53 □ 59	□ 9 □ 21 □ 38	□ 45 □ 47 □ 49	□ 53 □ 59	
Objective 3	Questic	ns:		Questic	ons:		Questic	Questions:		
	□ 12 □ 13 □ 16 □ 19	□ 29 □ 30 □ 31	□ 34 □ 54 □ 57	□ 12 □ 13 □ 16 □ 19	□ 29 □ 30 □ 31	□ 34 □ 54 □ 57	□ 12 □ 13 □ 16 □ 19	□ 29 □ 30 □ 31	□ 34 □ 54 □ 57	
Objective 4	Questio	ns:		Questions:			Questions:			
	□ 2 □ 3	□ 14 □ 25	□ 36 □ 56	□ 2 □ 3	□ 14 □ 25	□ 36 □ 56	□ 2 □ 3	□ 14 □ 25	□ 36 □ 56	
Objective 5	Questions:			Questions:			Questions:			
	□ 7 □ 23	□ 40 □ 44	□ 51 □ 55	□ 7 □ 23	□ 40 □ 44	□ 51 □ 55	□ 7 □ 23	□ 40 □ 44	□ 51 □ 55	
Objective 6	Questions:		Questions:			Questions:				
	□ 26	□ 39	□ 58	□ 26	□ 39	□ 58	□ 26	□ 39	□ 58	
Objective 7	Questio	ns:		Questions:			Questions:			
		□ 24	□ 43		□ 24	□ 43	□ 8	□ 24	□ 43	
Objective 8	Questions:			Questions:			Questions:			
	□ 5 □ 11 □ 22	□ 27 □ 32	□ 46 □ 60	□ 5 □ 11 □ 22	□ 27 □ 32	□ 46 □ 60	□ 5 □ 11 □ 22	□ 27 □ 32	□ 46 □ 60	
Objective 9	Questions:		Questions:		Questions:					
	□ 6 □ 15	□ 17 □ 20	□ 35 □ 42	□ 6 □ 15	□ 17 □ 20	□ 35 □ 42	□ 6 □ 15	□ 17 □ 20	□ 35 □ 42	
Objective 10	Questic	ns:		Questions:			Questions:			
	□ 4 □ 10	□ 18 □ 28	□ 50 □ 52	□ 4 □ 10	□ 18 □ 28	□ 50 □ 52	□ 4 □ 10	□ 18 □ 28	□ 50 □ 52	

Mathematics Chart

Perimeter

rectangle

 $P = 2\ell + 2w$ or $P = 2(\ell + w)$

Circumference

circle

 $C = 2\pi r$ or $C = \pi d$

Area

rectangle	$A = \ell w \text{ or } A = bh$
triangle	$A = \frac{1}{2}bh$ or $A = \frac{bh}{2}$
trapezoid	$A = \frac{1}{2} (b_1 + b_2)h$ or
	$A = \frac{(b_1 + b_2)h}{2}$
circle	$A = \pi r^2$

 $S = 6s^{2}$

Surface Area

cube

cylinder (lateral)	$S = 2\pi rh$
cylinder (total)	$S = 2\pi rh + 2\pi r^2 \text{ or }$
	$S = 2\pi r(h+r)$
cone (lateral)	$S = \pi r \ell$
cone (total)	$S = \pi r \ell + \pi r^2$ or
	$S = \pi r(\ell + r)$
sphere	$S = 4\pi r^2$

Volume

prism or cylinder $V = Bh^*$ pyramid or cone $V = Bh^*$ $V = \pi r^3$ sphere

*B represents the area of the base of a solid figure.

Pi

 $\pi \approx 3.14 \text{ or } \pi \approx \frac{22}{7}$

Pythagorean Theorem

 $a^2 + b^2 = c^2$

Slope of a Line

 $m = \frac{y_2 - y_1}{x_2 - x_1}$

Standard Form of an Equation Ax + By = C

Slope-Intercept Form of an Equation y = mx + b

Point-Slope Form of an Equation

 $y - y_1 = m(x - x_1)$

Distance Formula $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Midpoint Formula $M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

Quadratic Formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$



Mathematics Chart

CAPACITY AND VOLUME
Metric
1 liter = 1000 milliliters
Customary 1 gallon = 4 quarts
1 gallon = 128 ounces
1 quart = 2 pints
1 pint = 2 cups
1 cup = 8 ounces
TIME
1 year = 365 days
1 year = 12 months
1 year $= 52$ weeks
1 week = 7 days
1 day = 24 hours
1 hour = 60 minutes
1 minute = 60 seconds

8

5

Diagnostic Test

Read each question and choose the best answer.

- 1 Which set of ordered pairs describes a function? **A.1(B)**
 - **A** {(-2, -3), (-2, -4), (3, 6), (1, 2)}
 - **B** {(3, -3), (-3, 3), (-4, 4), (-4, 5)}
 - **C** {(4, -4), (-3, -3), (3, 6), (4, 2)}
 - **D** {(1, 3), (2, 4), (5, 7), (1, 3)}
- 2 A water tank is shaped like a cylinder with a diameter of 3 meters and a height of 12 meters. If the amount of water in the tank is one half the volume of the tank, how much water is in the tank?8.7(B)
 - **F** 15 cm^3
 - **G** 30 cm^3
 - **H** 42.4 m^3
 - **J** 169.6 cm^3
- 3 Bobby Jo put tomato plants in her garden. The table below shows the number of tomatoes Bobby Jo picked compared to the number of tomato plants. Which equation best describes the relationship between *t*, the number of tomatoes, and *p*, the number of tomato plants? A.7(A)

Plants	Tomatoes
2	10
4	18
6	26
8	34

- **A** t = p + 5
- **B** t = 2p + 8
- **C** t = 3p + 3
- **D** t = 4p + 2

4 Which inequality best describes the graph shown below? **A.1(D)**



F
$$y \le 4x$$

G $y \le -4x + 2$
H $y \le 4x + 2$
J $y \le -x + 2$

5 The formula for the total cost, *t*, of a car is 1 minus the discount *d*, times the sum of the base price, *b*, plus the cost of options, *c*. Which equation describes this situation? A.1(C)

$$\mathbf{A} \ t = 1 - d \times b + c$$

$$\mathbf{B} \quad t = \frac{b+c}{1-d}$$

C
$$t = (1 - d) \times (b + c)$$

$$\mathbf{D} \quad t = \frac{1-d}{b+c}$$

6 Which could be the lengths of the sides of the triangle shown below? 8.7(C)



F 1, 3, 5
G 0.03, 0.04, 0.05
H 3.2, 4.2, 5.2
J 2, 4, 5



7 The table below shows the height of a tree for several years.

Year	Height (inches)
2003	25
2006	43
2009	61

If the tree continues to grow at the rate shown in the table, what will be its height in the year 2015? **A.6(G)**

- **A** 63 in.
- **B** 67 in.
- **C** 73 in.
- **D** 97 in.

8 What is the relationship between the graph of $y = 3x^2 + 2$ and the graph of $y = -3x^2 + 2$? **A.9(B)**

- **F** The graph of $y = 3x^2 + 2$ is a reflection of $y = -3x^2 + 2$ across the line *x*-axis.
- **G** The graph of $y = 3x^2 + 2$ is a reflection of $y = -3x^2 + 2$ across the line x = 2.
- **H** The graph of $y = 3x^2 + 2$ is a reflection of $y = -3x^2 + 2$ across the line y = -3.
- J The graph of $y = 3x^2 + 2$ is a reflection of $y = -3x^2 + 2$ across the line y = 2.
- **9** In the figure below, triangle *MNP* is similar to triangle *RST*.



Which scale factor was used to transform triangle *MNP* to triangle *RST*? **8.6(A)**,



10 Which is the parent function of the function graphed below? **A.2(A)**



11 What is the volume of the rectangular prism shown below? **8.8B**



- A 24 cm³
 C 140 cm³

 B 49 cm³
 D 490 cm³
- **12** If triangle *ABC* is similar to triangle *EDC*, what is the value of *x*? **8.9(B)**





- **13** Jake's total annual salary, *t*, is his hourly rate, *w*, times the number of hours, *h*, he works that year. He also gets an annual bonus, *b*. Which equation represents Jake's total annual salary? **A.1(A)**
 - $\mathbf{A} \ t = h(b+w)$
 - **B** t = w(h + b)
 - $\mathbf{C} \quad t = w \times h \times b$
 - $\mathbf{D} \ t = wh + b$
- 14 What are the coordinates of the *x*and *y*-intercepts of the graph shown below? A.6(E)



- **F** (0, -1) and (-3, 0)
- **G** (-1, 0) and (0, 3)
- **H** (0, 3) and (-1, 0)
- **J** (-1, 0) and (0, -3)
- **15** Which point on the grid satisfies the conditions $x \le 2$ and y > -1? **8.7(D)**



- **A** point L
- **B** point M
- **C** point N
- **D** point P

16 The table below shows the population of a town every 10 years from 1980 to 2000.

Year	Population
1980	25,328
1990	26,754
2000	28,180

If the population of the town continues to grow at the same rate, what will be the population in 2030?

- **A.7(C) F** 29,606
- **G** 29,766
- **H** 32,458
- **J** 33,032
- 17 Of the 90 textbooks on a bookshelf, 30% are science textbooks. Of the remaining books, one third are history textbooks. How many history textbooks are on the book shelf? 8.3(B)
 - **A** 21
 - **B** 30
 - **C** 33
 - **D** 63
- **18** How does the graph of $y = 2x^2$ differ from the graph of $y = 2x^2 + 2$? **A.9(C)**
 - **F** The graph of $y = 2x^2 + 2$ is a narrower than the graph of $y = 2x^2$.
 - **G** The graph of $y = 2x^2 + 2$ is wider than the graph of $y = 2x^2$.
 - **H** The graph of $y = 2x^2 + 2$ is a vertical translation of the graph of $y = 2x^2$.
 - **J** The graph of $y = 2x^2 + 2$ is a horizontal translation of the graph of $y = 2x^2$.



- 19 The first 4 terms of a sequence of numbers are 3, 7, 19, 55. Which rule could describe the sequence? 8.16(A)
 - A Multiply the previous number by 2 and add 1.
 - **B** Multiply the previous number by 2 and add 5.
 - **C** Multiply the previous number by 3 and subtract 2.
 - **D** Multiply the previous number by 4 and subtract 5.
- 20 A cube has a volume of 1331 cubic centimeters and a surface area of 726 square centimeters. What is the length of a side of the cube? 8.14(C)
 - **F** 9 cm
 - **G** 11 cm
 - **H** 19 cm
 - **J** 21 cm
- **21** What is the range of the function shown on the graph below? **A.2(B)**



A $x \le 2$ **B** $0 \le x \le 2$ **C** y < 6**D** $0 \le y \le 6$

- 22 Mr. Gonzalez wants to find the cost, *C*, of a cover for his circular swimming pool. He knows the cost per square foot of cover, *u*, and he knows the radius, *r*, and height, *h*, of the pool. Which formula can Mr. Gonzalez use to find the total cost of the cover? 8.7(B)
 - **F** $T = 2\pi r u$
 - **G** $T = \pi r^2 u$
 - **H** $T = \pi rh$
 - $\mathbf{J} \quad V = \pi r^2 h$
- 23 If the length of each side of a cube with a volume of 30 cubic inches is tripled, what will be the volume of the new cube in cubic inches?8.10(B)

Record your answer and fill in the bubbles in the answer grid below.

	8	1	0	0	0	0
0	0	0	0	0	0	0
0	0	1	1	1	1	1
2	0	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
0	0	\bigcirc	0	0	\bigcirc	\bigcirc
8	8	8	8	8	8	8
9	9	9	9	9	9	9

- 24 A spherical water tank has a radius of 10 feet. If the tank is empty, and then water is pumped into it at a rate of 46.5 cubic feet per minute, about how long will it take to fill the water tank?8.8(C)
 - **A** 60 min
 - **B** 70 min
 - **C** 80 min
 - **D** 90 min



Diagnostic Test (continued)

25 Which statement is true about all of these polygons? **8.16(B)**



- **F** Opposite sides are congruent.
- **G** Adjacent angles are supplementary.
- **H** Opposite sides are parallel.
- **J** None of these are true.
- **26** The table shows 3 pairs of *x* and *y*-coordinates.

x	У
3	4.6
5	7.0
7	9.4

What is the slope of a line through the points with these coordinates? **A.1(E)**

- **A** 1.2
- **B** 2.4
- **C** 3.2
- **D** 4.6
- 27 Ms. Jones can find the total monthly cost, c, of operating her business by using the equation c = 45h + 1750, where h is the total number of hours her business is open during the month. If the cost in June was \$3685, how many hours was her business open that month? A.7(B)
 - **F** 25
 - **G** 43
 - **H** 65
 - **J** 81

- **28** If $y = x^5$, what is equivalent to x^{30} ? **A.11(A) A** y^6 **C** y^{25} **B** y^{15} **D** y^{35}
- **29** If triangle PQR is reflected across the *x*-axis to become triangle P'Q'R', what will be the coordinates of Q'? **8.6(B)**



30 The graph below shows Ms. Colbert's earnings versus sales.



According to the graph, which statement is true about Ms. Colbert's earnings? **A.2(C)**

- **A** They are 600 when sales are 2000.
- **B** They are \$400 when sales are \$3000.
- **C** They are 300 when sales are 2000.
- **D** They are \$300 when sales are \$3000.



31 The table below shows the high temperature for each of the first 5 days in April.

Day	1	2	3	4	5
Temperature	78	82	83	82	85

Which two measures of this data would NOT change if the temperature was 80, rather than 78, on the first day of April? **8.12(A)**

- **F** mean and mode
- **G** mean and range
- **H** median and mode
- **J** mode and range
- 32 The floor of Kimberlee's room is shaped like a square. The distance from one corner of the room to the opposite corner is almost 30 feet. What is the approximate length of each side of the room? 8.9(A)A 9 ft
 - **B** 15 ft
 - **C** 19 ft
 - **D** 21 ft
- **33** What is the solution to this system of linear equations? **A.8(B)**
 - 3x 2y = 96x + 3y = 39
 - **F** (3, -5) **G** (3, 5)
 - **H** (5, -3)
 - **J** (5, 3)

34 Triangle *RST* has coordinates R(-5, 4), S(-1, 2) and T(2, 6). What will be the new coordinates of point *T* if the triangle is translated 3 units to the right and 5 units down? **8.7(A)**



- **A** (5, 1)
- **B** (−5, −1)
- **C** (2, −3)
- **D** (−2, −1)
- **35** Ali spent \$325 on transportation last month. Of the total, he spent \$130.00 on bus rides and \$195 on train rides. Each train ride cost \$6.50. Which equation can be used to find the number of train rides, *n*, that Ali took last month? **8.15(A)**
 - **F** 325 130 = 195
 - **G** 325 130 = 195n
 - **H** $n = 195 \div 6.50$
 - $J \quad n = 195 \times 6.50$
- **36** Tiyanna received a 4% increase in salary last year. If her annual salary was *x* dollars before the increase, what was her annual salary afterward? **A.3(A)**
 - **A** *x* + 4
 - **B** *x* + 0.04
 - **C** x + 0.4x
 - **D** x + 0.04x



37 The table below shows the population and the per capita income of 5 cities.

City	Population	Income
Austin	656,562	\$32,185
El Paso	563,662	\$35,432
Lubbock	199,564	\$41,418
Fort Worth	534,694	\$42,939
Amarillo	173,627	\$42,536

Which statement best describes the relationship between the population and per capita income of these cities? **8.13(B)**

- **F** The lower a city's population, the lower its per capita income.
- **G** The higher a city's population, the higher its per capita income.
- **H** There is a direct relationship between population and per capita income.
- **J** There is no relationship between population and per capita income.
- **38** Which expression can be used to find the values of f(n) in the table below?**A.3(B)**

n	1	2	3	4	5
f(n)	6	9	12	15	18

- **A** 3*n*
- **B** 3*n* + 3
- **C** n + 5
- **D** 6*n* 3
- **39** If the radius of a circle with an area of 20 square inches is doubled, what will be the area of the new circle? **8.10(A)**
 - **F** 40 sq in.
 - **G** 80 sq in.
 - **H** 120 sq in.
 - **J** 400 sq in.

- **40** The Smith Flower Shop sells roses for \$4.00 each and carnations for \$1.75 each. On Valentine's Day, it sold 240 more roses than carnations and made \$1908.75. Which system of equations could be used to find the number of roses, *r*, and carnations, *c*, sold that day? **A.8(A)**
 - **A** 1.75r + 4c = 1908.75r = 240 - c
 - **B** 4r + 1.75c = 240c = r + 240
 - **C** 4r + 1.75c = 1908.75c = r - 240
 - **D** 4r + 1.75c = 1908.75c = r + 240
- 41 The graph below shows *h*, the height in feet of a football, versus *t*, the time in seconds after the football is thrown. From the graph, what conclusion can be made? A.9(D)



- **F** When it was thrown, the football was about 6 feet off the ground.
- **G** The football reached a height of over 40 feet.
- **H** The football landed less than 10 seconds after it was thrown.
- **J** The football was in the air for more than 12 seconds.



Diagnostic Test (continued)

42 Leroy has 5 Houston Astros cards and 5 Texas Ranger cards in his pocket. If he randomly selects 2 cards from his pocket, what is the probability that both are Houston Astros cards? **8.11(A)**

Α	$\frac{2}{9}$	С	$\frac{1}{2}$
В	$\frac{4}{9}$	D	$\frac{1}{5}$

- 43 Pablo weighs 30 pounds less than twice Sam's weight, w. If Pablo weighs 180 pounds, which equation can be used to find Sam's weight?
 8.14(A)
 F 30 2w = 180
 - **G** 2(w-30) = 180
 - **H** 2w 30 = 180
 - **J** 2(30 w) = 180
- **44** The ordered pairs (2, 5), (4, 1), and (8, -7) are solutions to which function? **A.5(C) A** y = -x + 7 **C** y = -2x + 9**B** y = 2x + 1 **D** y = 3x - 1
- **45** Which coordinates represent the roots of the function graphed below? **A.10(B)**



- **F** (-1, 9) and (0, 8)
- **G** (0, -4) and (2, 0)
- **H** (-4, 0) and (2, 0)
- **J** (0, -4) and (0, 2)

- **46** Which expression is equivalent to $4(x + 4)(x + 2) 2(x^2 + 4x + 12)$? **A.4(B) A** $2x^2 + 8$
 - **B** $2x^2 + 16x$
 - **C** $2x^2 + 16x + 8$
 - **D** $2x^2 + 16$
- **47** Which is the equation of the line that passes through the point at (3, 5) and is parallel to the graph of -4x + y = 4? **A.6(D)**
 - **F** y = 4x + 4 **G** y = 4x + 7**H** y = 4x - 7
 - **J** y = -4x + 7
- **48** The chart below shows the frequency of different meals offered for lunch last month. What is the probability that tacos was served for lunch the first day of the month? **8.11(B)**

Item	Frequency
Pizza	8
Tacos	5
Spaghetti	3
Fish and Chips	4
Chicken	4
Chili	6

D 30%

A
$$\frac{1}{5}$$
 C $\frac{1}{6}$

В



Diagnostic Test (continued)

- **49** The area of a parallelogram is $5x^2 + 19x + 12$, and its height is x + 3. Which expression represents the parallelogram's base? **A.4(A) F** 5x + 16**G** 5x - 4
 - **H** 5x 4
 - **J** 5x 16**J** 5x + 4
- 50 Mr. Brooks is going to drive from Missouri City to Wichita Falls, a distance of 350 miles. If he drives at an average speed of 40 mph, when is the latest time he can leave Houston and arrive in Witchita Falls before 2:00 P.M.? 8.14(B)
 - **A** 5:15 A.M.
 - **B** 7:45 A.M.
 - **C** 8:15 A.M.
 - **D** 8:45 A.M.
- **51** Which of the following CANNOT be described by a linear function? **A.5(A)**
 - **F** the volume of a cylinder as its height increases
 - **G** the volume of a cylinder as its radius increases
 - **H** the volume of a rectangular prism as its height increases
 - J the volume of a triangular prism as its height increases

- **52** What are the roots of the equation $y = -6x^2 + 8x 2?$ **A.10(A)**
 - **A** -1 and 0

B
$$-2$$
 and $\frac{1}{3}$

- **C** 0 and 1
- **D** $\frac{1}{3}$ and 1

53 The graph of y = 0.5x + 3 is shown below.



If the *y*-intercept remains the same and the slope is tripled, what will be the *x*-intercept? **A.6(C)**

F -3
G
$$-\frac{3}{2}$$

H -2
J $-\frac{1}{2}$



54 The net of a triangular prism is shown below. Use the ruler on the Mathematics Chart to measure the dimensions of the prism to the nearest tenth of a centimeter.



Which is the best estimate of total surface area of the prism? **8.8(A)**

- **A** 11 cm^2
- **B** 13 cm²
- **C** 18 cm^2
- **D** 22 cm^2
- **55** What rate of change is shown in the graph below? **A.6(A)**



F 1

- **G** 1.5
- H 2 J 2.5

56 The graph below shows the speed of a train as it slows to a stop. Which statement best describes the rate of change of the train's speed? A.6(B)



- **A** The train slows about 10 miles per hour every 10 seconds.
- **B** The train slows about 2 miles per hour every second.
- **C** The train slows about 5 miles per hour every 8 seconds.
- **D** The train slows about 8 miles per hour every 5 seconds.



TAKS Practice

OBJECTIVE 1

A.1(A) The student is expected to describe independent and dependent quantities in functional relationships.

Read each question and choose the best answer.

1 The area of a triangle is given by the

function $A = \frac{1}{2}bh$. Which statement is true?

- **A** The area of the triangle depends on the product of the base and the height divided by 2.
- **B** The area of the triangle depends on the product of the base and the height multiplied by 2.
- **C** The area of the triangle depends on the product of the base and the height divided by $\frac{1}{2}$.
- **D** The area of the triangle depends on the product of the base and the height.
- **2** Consider the quadratic equation $y = 3x^2 + 4$. Which of the following statements is true?
 - **F** The value of y is dependent on the slope.
 - **G** The value of y is dependent on the value of x.
 - **H** The value of y is independent of any of the values in the rest of the equation.
 - **J** The *y*-intercept changes with respect to the slope of the equation.

3 In the general linear equation

y = mx + b, how does changing the slope affect the independent variable?

- **A** There is a direct positive change on the value of the independent variable.
- **B** There is a direct negative change on the value of the independent variable.
- **C** There is a weak positive change in the value of the independent variable.
- **D** There is no affect on the independent variable.
- **4** Purchasing a car in Texas requires paying up to 8.25% in sales tax. Other fees may be added as well, such as licensing, shipping, and so on. Which of the following is considered to be the dependent variable when calculating the price of the car?
 - **F** the final cost of the car after taxes and fees
 - ${\boldsymbol{\mathsf{G}}}$ the cost of the car before taxes and fees
 - **H** the sales tax
 - **J** the fees imposed upon the price of the car
- **5** Which of the following statements is NOT correct?
 - **A** The height of a tree is dependent upon time.
 - **B** The price of a cup of coffee is dependent upon the cost of harvesting coffee beans.
 - **C** The volume of water in a fish tank is dependent upon the rate of water flow into the tank.
 - **D** The speed of a sailboat is dependent upon the time required to prepare the sailboat.

OBJECTIVE 1

A.1(B) The student is expected to gather and record data and use data sets to determine functional relationships between quantities.

Read each question and choose the best answer.

1 Which equation could be used to generate this table of values?

X	у
-5	<u>25</u> 3
2	<u>11</u> 3
7	<u>1</u> 3

A
$$y = -\frac{5}{3}x$$

B $y = 5 - \frac{2}{3}x$
C $y = \frac{1}{3}x + \frac{20}{3}$
D $y = -3x + \frac{10}{3}$

2 Avery Ranch Golf Club in Austin offers a weekly golf membership that includes an initiation fee and monthly fee. The cost based on number of months played is shown in the table below.

Months (<i>m</i>)	Cost (C)
2	\$840
5	\$1275
8	\$1710
12	\$2290

Which function can be used to describe this relationship?

- **F** C = 420m
- **G** C = 500 + 170m
- **H** C = 500 + 220m
- **J** C = 550 + 145m

3 Ilsa is putting money into her savings account every 2 weeks so that she can buy a moped. The table below illustrates the balance after each deposit.

Number of Deposits (<i>d</i>)	Balance (<i>b</i>)
1	\$690
2	\$780
3	\$870
4	\$960
5	\$1050

Which function can be used to describe this relationship?

- **A** b = 650 + 40d
- **B** b = 500 + 190d
- **C** b = 600 + 90d
- **D** b + 90d = 600
- **4** Which equation best describes the relationship between the corresponding values of *x* and *y* shown in the table below?

X	у
-6	$-\frac{4}{5}$
-1	<u>1</u> 5
10	<u>12</u> 5

F	x + 5y = -10	H $x - 5y = 2$
G	5y - x = 2	J $-5y - x = 10$

5 Which equation best describes the functional relationship in the data set below?

{(-8, -13), (4, 11), (12, 27)}? **A** y = -2x - 3 **C** y = 2x + 3**B** y = 2x - 1 **D** y = 4x + 19

OBJECTIVE 1

A.1(C) The student is expected to describe functional relationships for given problem situations and write equations or inequalities to answer questions arising from the situations.

Read each question and choose the best answer.

- **1** Rachel has an assortment of nickels, dimes and pennies in a change jar. Aside from the dimes, the rest of the change adds up to \$2.83. What equation best represents the relationship between the total amount of money in the jar, *T*, and the number of dimes, *d*?
 - **A** T = 2.83 0.1d
 - **B** T = 0.1d + 2.83
 - **C** T = 0.1d 2.83
 - **D** T = 0.01d + 2.83
- **2** A person's height in centimeters, *h*, can be estimated by multiplying 1.1 by the length of his foot, *f*, and then adding 143.6. Which equation best represents this relationship?

F f = 1.1h + 143.6 **G** h = 1.1f + 143.6**H** 143.6 = 1.1f + h

- **J** h = 143.6 1.1f
- **3** The grocery store packages chicken breasts in boxes. The empty box weighs 400 grams. Each chicken breast weighs a maximum of 150 grams. Which inequality best describes the total weight in grams, *w*, of a box of chicken breasts in terms of *b*, the number of chicken breasts in the box?

A $w \ge 150b + 400$

- **B** $w \ge 150 + 400b$
- **C** $w \le 400 + 150b$
- **D** $w \le 400b + 150$

- **4** Suppose that the total cost, *C*, of renting a sailboat is \$285 per day, *d*, plus a nonrefundable deposit of \$250. Which equation best represents this relationship?
 - **F** C = 200d + 285
 - **G** C = 250d + 285
 - **H** C = 285d + 200
 - **J** C = 285d + 250
- **5** The temperature in degrees Fahrenheit, *F*, is the sum of $\frac{9}{5}$ of the temperature in degrees Celsius, *C*, and the constant 32. Which equation best represents this relationship?

A
$$F = \frac{9}{5}C + 32$$

B $F = \frac{9}{5}(C - 32)$
C $F = \frac{9}{5} + C + 32$
D $F = \frac{9}{5}(C + 32)$

6 The table below outlines the cost of a yoga and health club membership.

Months (<i>m</i>)	Total (7)	
3	\$117.50	
8	\$255.00	
11	\$337.50	

Which equation best represents this relationship?

F
$$T = 15m + 72.5$$

- **G** T = 27.5 + 30m
- **H** T = 35 + 27.5m
- **J** T = 42.5 + 25m

OBJECTIVE 1

A.1(D) The student is expected to represent relationships among quantities using concrete models, tables, graphs, diagrams, verbal descriptions, equations, and inequalities.

Read each question and choose the best answer.

1 The following graph depicts the amount remaining on a loan, *L*, after *n* months of payments.



Which equation best represents the functional relationship?

- **A** L = 100n
- **B** L = 1000 100n

C
$$L = 1200 - 100n$$

D
$$L = 1200 - 120n$$

2 Which inequality best describes the graph shown below?



- **F** $y \le 5 2x$ **G** $y \ge 5 - 2x$ **H** $y \le 2 - 5x$
- **J** $y \ge 2 5x$

3 The following table illustrates the average rate for a Web designer to design a Web site.

Number of Hours (<i>n</i>)	Total (7)	
3	\$171.87	
14	\$802.06	
22	\$1260.38	

Which equation best represents this functional relationship?

- **A** T = 21.87 + 50n
- **B** T = 40n + 51.87
- **C** T = 57.29n

D
$$T = 60n - 9.13$$

4 Which equation best represents the shaded area in the diagram below?



5 Connie rents a lawnmower for \$20 per week and pays \$15 in gas for the same period. She charges \$5 per lawn mowed. What is the best way to describe the functional relationship that determines her weekly earnings, *E*, based on the number of lawns that she mows, *m*?

A
$$E = 35m - 5$$

B
$$E = 35 - 5m$$

$$E = 5m + 35$$

D
$$E = 5m - 35$$

TAKS Practice

OBJECTIVE 1

A.1(E) The student is expected to interpret and make decisions, predictions, and critical judgments from functional relationships.

Read each question and choose the best answer.

1 The graph below represents which of the following relationships between height and time?



- A the height of a rock falling from the top of a cliff on a windy day with respect to time
- **B** the height of a feather thrown out a window with respect to time
- **C** the height of a person jumping from an airplane with respect to time before and after opening a parachute
- **D** the depth of an anchor being released into the water with respect to time
- **2** The table below presents selected values of a functional relationship between *x* and *y*.

x	У
1	3
2	5
3	7
4	9

Based on the information in the table, which statement is true?

- $\mathbf{F} \quad y > x + 1$
- **G** y < x
- **H** y = x
- $\mathbf{J} \quad y < x + 1$

- **3** Which set of ordered pairs describes a function?
 - $A \{(2, 4), (4, 4), (6, 4), (2, 8)\}$
 - **B** {(1, 3), (3, 5), (5, 7), (7, 9)}
 - **C** {(1, -1), (-1, -4), (-1, -3), (1, -3)}
 - **D** {(-3, 6), (-6, 3), (-3, -6), (3, 9)}
- **4** Maxwell Adventures provides fishing packages from Port O'Connor to Corpus Christi. The prices range from \$400 to \$1500 per day. What equation best represents this price difference, *P*, per day, *d*, as a functional relationship?
 - **F** P = 1500 400d
 - **G** P = 1500d
 - **H** P = 1100d
 - **J** P = 400d
- **5** What functional relationship is best represented by the following table?

Time (t)	Height (<i>h</i>)		
5 min	690 m		
12 min	1530 m		
18 min	2250 m		
27 min	3330 m		

- **A** h = 138t
- **B** h = 120 + 90t
- **C** h = 100t + 190
- **D** h = 90 + 120t

OBJECTIVE 2

A.2(A) The student is expected to identify and sketch the general forms of linear (y = x) and quadratic $(y = x^2)$ parent functions.

Read each question and choose the best answer.

1 Identify the linear equation for the graph below.



2 Identify the quadratic equation for the graph below.



3 Identify the linear equation for the graph below.



A
$$y = 4 - 5x$$

B $y = -5x + 3$
C $y = -3x + 4$
D $y = 3 - 4x$

4 Identify the quadratic equation for the graph below.



F
$$y = x^2 + 2$$

H $y = \frac{1}{2}x^2 + 2$
G $y = 2x^2 + 2$
J $y = \frac{1}{4}x^2 + 2$

Λ

TAKS Practice

OBJECTIVE 2

A.2(B) The student is expected to identify the mathematical domains and ranges and determine reasonable domain and range values for given situations, both continuous and discrete.

Read each question and choose the best answer.

1 What is the domain of the following graph?



A
$$-1 \le y \le 2$$

B $-1 < y < 2$
C $-4 \le x \le 5$
D $-4 < x < 5$

2 What is the range of the following graph?



F
$$-2 \le y \le 4$$

G $-2 < y < 4$
H $-3 \le x \le 1$

J -3 < x < 1

3 What is the domain of the following data set?

$$\{(-4, 2), (1, -4), (6, -10)\}\$$

 $\{-10, -4, 1, 2, 6\}$

A
$$\{-10, -4, 1, 2, \mathbf{R} \in \{4, 1, 6\}$$

- **D** -4 < x < 6
- **4** What is the range of the function below?

x	У
3	-12
1	-4
-5	20

F
$$\{-5, 1, 4\}$$

H
$$\{-12, -4, 20\}$$

- **J** $\{-12, -5, -4, 1, 3, 20\}$
- **5** General admission Texas Rangers tickets cost \$40 each. What is the range of ticket prices if purchasing from 1 to 5 tickets?
 - **A** 0 < y < 5
 - **B** {1, 2, 3, 4, 5}
 - **C** {40}
 - **D** {40, 80, 120, 160, 200}

6 The function $y = \frac{2}{5}x + 3$ has a domain of {-5, 0, 5}. What is the range? F {-5, 3, 5} G {1, 3, 5} H {1, 5, 15} J {3, 5, 7}

OBJECTIVE 2

A.2(C) The student is expected to interpret situations in terms of given graphs or create situations that fit given graphs.

Read each question and choose the best answer.

1 The Sheldon Mining Company purchased a digging machine for \$400,000. Due to the amount of usage, the machine lost value each year until it was deemed worthless after 6 years. The graph shows the value of the machine over a period of several years.



Which is a reasonable conclusion about the value of the system?

- A The machine declined in value more quickly in the last 2 years than it did in the first 2 years.
- **B** The machine declined in value at a constant rate.
- **C** The machine declined in value more quickly in the first 2 years than it did in the last 2 years.
- **D** The system lost half its value in 3 years.

2 What statement Could be true for the graph below?



- **F** Mr. Turner makes \$250 when he sells \$4000 worth of merchandise.
- **G** Ms. Colter earns \$75 per sale.
- **H** Ms. Sumter will earn a minimum of \$100 per day regardless of how much she sells.
- J Mr. Bole will clear \$400 when he sells \$5000 in goods.
- **3** Which statement could NOT be true for the graph below?



- A A person is walking at a rate of 3 km/hr.
- **B** Water is draining from a tank at a rate of 3 L/min.
- **C** A car is moving at a speed of 5 ft/sec.
- **D** Each ticket costs \$3.

TAKS Practice

OBJECTIVE 2

A.2(D) The student is expected to collect and organize data, make and interpret scatterplots (including recognizing positive, negative, or no correlation for data approximating linear situations), and model, predict, and make decisions and critical judgments in problem situations.

Read each question and choose the best answer.

1 The following scatterplot is a partial view of the gas mileage of cars at certain speeds.



Which of the following statements is incorrect?

- A It appears that a car's mileage is maximized around 50 mph.
- **B** A car's mileage appears to decrease when speed exceeds 50 mph.
- **C** A car's mileage appears to decrease when the car continues to slow below 50 mph.
- **D** There is no visual evidence that links gas mileage to a car's speed.

2 Which characterizes the graph below?



- **F** strong positive correlation
- **G** weak positive correlation
- **H** strong negative correlation
- **J** neither positive or negative correlation
- **3** Several teams of trivia experts were questioned about the number of hours they practiced per week and number of wins. The graph shows the results of the survey.



Based on these results, if a team practices for 5 hours per week, which is the best estimate for the number of games the team can expect to win?

Α	20	С	8
В	12	D	3

A.3(A) The student is expected to use symbols to represent unknowns and variables.

Read each question and choose the best answer.

1 There are 45 CDs and 82 DVDs in a bargain box at the mall. The CDs cost an average of *x* dollars each and the DVDs cost an average of *y* dollars each. Which expression gives the average cost per item in the bargain box?

A
$$\frac{45y + 82x}{127}$$

B $\frac{45x + 82y}{127}$
C $\frac{45x + 82y}{45}$
D $\frac{127}{45x + 82y}$

- **2** Andrea receives a 5% raise at her part-time sales job. If she was earning x dollars per week before her raise, how much is she earning now?
 - **F** x + 0.5**G** x + 0.5x**H** x + 0.05x
 - **J** x + 5x
- **3** The Skate Place sells 45 skateboards per month at a cost of \$32 each. When the price of the skateboards increases by x dollars, the number of skateboards sold decreases by *v*. Which expression describes this relationship?

A
$$(32 + x)(45 - y)$$

B
$$(32 + x)(45 + y)$$

C
$$(32 - x)(45 - y)$$

D (32 - x)(45 + y)

- **4** A bookstore sells paperback novels for x dollars each. If the cost of paperbacks decreases by 8%, for how much will they be sold?
 - **F** x + 0.08x
 - **G** x 0.08x
 - **H** x 0.8x
 - **J** x + 0.8x
- **5** Steve loads jars of tomato sauce into a box. The box weighs 1.1 kilograms. Each jar of tomato sauce weighs 0.56 kilograms. If the function y = 0.56x + 1.1 describes the total weight, what does the variable x represent?
 - **A** the number of boxes of tomato jars
 - **B** the number of jars of tomato sauce packed into the box
 - **C** the total weight of the tomato jars
 - **D** the total weight of the tomato jars and box
- **6** The Houston Zoo charges an admission fee of \$8.50 for adults and \$4.00 for children. There are x adults and y children in a group of 40 people. Which expression describes the total cost for the group to attend the zoo?

x) *y*)

$$F \quad \frac{8.5y + 4x}{40} \\ G \quad \frac{8.5x + 4y}{40} \\ H \quad 8.5x + 4(40 - \mathbf{J}) \\ 8.5x + 4(40 - \mathbf{J}) \\ R = \frac{1}{2} \\ 8.5x + 4(40 - \mathbf{J}) \\ R = \frac{1}{2} \\ R = \frac{1}{2$$

TAKS Practice

OBJECTIVE 2

A.3(B) The student is expected to look for patterns and represent generalizations algebraically.

Read each question and choose the best answer.

1 Which expression can be used to find the value of *b*(*n*) in the table below?

n	1	2	3
<i>b</i> (<i>n</i>)	4	6	8

- **A** *n* + 3
- **B** 2n + 2
- **C** 3n-2
- **D** 4*n*
- **2** Which expression can be used to find the average of 2 consecutive even numbers?

$$F \frac{n(n + 1)}{2}$$

$$G \frac{n(n + 2)}{2}$$

$$H \frac{n + (n + 1)}{2}$$

$$J \frac{n + (n + 2)}{2}$$

- **3** Which of the following expressions will NOT produce an even integer for any given integer *n*?
 - **A** 2*n*
 - **B** 2*n*−2

D
$$2n + 1$$

4 The table shows the total cost for tickets to the Downtown Aquarium in Houston.

		Adults		
		1	2	3
Children	1	\$15.50	\$24.75	\$34.00
	2	\$21.75	\$31.00	\$40.25
	3	\$28.00	\$37.25	\$46.50

Which of the following expressions can be used to determine the cost of *a* adults and *c* children?

F
$$\frac{9.25a + 6.25c}{a + c}$$

G $\frac{15.50(a + c)}{a + c}$

H
$$9.25a + 6.25c$$

J
$$6.25a + 9.25c$$

- **5** Which expression can be used to find the product of 3 consecutive numbers where *n* is the median?
 - **A** n(n+1)(n+2)
 - **B** (n-1)(n)(n+1)
 - **C** (n-2)(n-1)n
 - **D** (n-2)(n)(n+2)
- **6** Which expression can be used to find the value of *t*(*n*) in the table below?

n	1	2	3	4	
<i>t</i> (<i>n</i>)	-5	-3	_1	1	
5n - 10					

G
$$2n - 7$$

H $n - 6$
J $\frac{-10n}{2}$

2

F

OBJECTIVE 2

A.4(A) The student is expected to find specific function values, simplify polynomial expressions, transform and solve equations, and factor as necessary in problem situations.

Read each question and choose the best answer.

- **1** The area of a rectangle is $12x^2 25x + 12$, and the width is 3x - 4. Which expression best represents the rectangle's length?
 - **A** 3*x*−4
 - **B** 3x + 4
 - **C** 4x 3
 - **D** 4x + 3
- **2** The side length of a square is 2x 1. Which expression best represents the area of the square in simplest terms?
 - **F** $4x^2 + 4x 1$
 - **G** $4x^2 + 4x + 1$
 - **H** $4x^2 4x 1$
 - **J** $4x^2 4x + 1$
- **3** The demand function for a new product is p(x) = -5x + 35, where *p* is the selling price of the product and *x* is the number of units sold in the thousands. What is the formula for the revenue function r(x), which is the product of the number of units sold and the demand function?
 - **A** $r(x) = 5x 35x^2$ **B** $r(x) = -5x + 35x^2$ **C** $r(x) = 5x^2 - 35x$ **D** $r(x) = -5x^2 + 35x$

- **4** An abandoned field is being prepared for a housing project. The length of the field is 50 feet longer than 3 times the width of the field. If the width of the field is *x*, what are the dimensions of the field?
 - **F** x ft by 3x ft
 - **G** *x* ft by 3x 50 ft
 - **H** x ft by 3x + 50 ft
 - **J** 3x ft by x + 50 ft
- **5** Factor the expression.
 - $-12x^2 + 29x 15$
 - **A** (4x-3)(5-3x)
 - **B** (4x-3)(3+3x)
 - **C** (4x + 3)(5 3x)
 - **D** (4x-5)(3-3x)

6 Simplify the polynomial expression.

 $(5x^{2} - 5x - 3) - (7x^{2} - 6x + 1)$ **F** $-2x^{2} - 11x + 4$ **G** $-2x^{2} - 11x - 4$ **H** $-2x^{2} + x - 3$ **J** $-2x^{2} + x - 4$

TAKS Practice

OBJECTIVE 2

A.4(B) The student is expected to use the commutative, associative, and distributive properties to simplify algebraic expressions.

Read each question and choose the best answer.

- **1** Simplify the algebraic expression.
 - 2(x+4)(x-3) + 3(3-x)(5-x)
 - **A** $5x^2 21x + 22$
 - **B** $5x^2 22x + 21$
 - **C** $5x^2 12x + 21$
 - **D** $5x^2 12x + 11$
- **2** Simplify the algebraic expression.
 - (x-7)(x-6) 4x(x+8) **F** $-3x^2 45x + 42$ **G** $-3x^2 45x 42$ **H** $-3x^2 + 19x + 42$ **J** $-3x^2 + 19x 42$
- **3** Which expression is equivalent to the following?
 - $3(x^2 + 3x 2) 5(x + 1)$
 - **A** $3x^2 + 14x 1$
 - **B** $3x^2 14x 1$
 - **C** $3x^2 4x 11$
 - **D** $3x^2 + 4x 11$

4 The area of a rectangle is $6x^2 - 17x - 45$. What are the factors of this trinomial?

F (3x-5)(2x-9)**G** (3x+5)(2x-9)

- **H** (3x-5)(2x+9)
- **J** (3x+5)(-2x+9)

- **5** Simplify the algebraic expression. $(3x^2-5x+4)(2x+3)$ **A** $6x^3 - x^2 - 7x + 12$ **B** $6x^3 + x^2 - 7x + 12$ **C** $6x^3 - x^2 + 7x + 12$ **D** $6x^3 - x^2 - 23x + 12$
- 6 Simplify the expression. $x(x-3)^2 - 4x(2-3x)$ F $x^3 + x^2 - 6x$ G $x^3 + 2x^2 - 6x$ H $x^3 + 6x^2 - x$ J $x^3 + 6x^2 + x$
- 7 Which expression is equivalent to $5x(x + 3)(x - 4) + 3x(x - 3)^2$? **A** $8x^3 + 13x^2 - 33x$ **B** $8x^3 - 13x^2 + 33x$ **C** $8x^3 - 23x^2 - 33x$ **D** $8x^3 - 23x^2 - 87x$
- 8 Simplify the algebraic expression. (5x-3)(x-2)(2x+5) - (3x-2)(2x-5)(x-4)F $4x^3 + 42x^2 - 123x + 40$ G $4x^3 + 42x^2 - 23x + 70$ H $4x^3 + 42x^2 - 139x + 70$ J $4x^3 + 42x^2 + 23x + 70$

OBJECTIVE 3

A.5(A) The student is expected to determine whether or not given situations can be represented by linear functions.

Read each question and choose the best answer.

- **1** Which problem situation CANNOT be represented by a linear function?
 - A the commission earned on a sale at a commission rate of 5.5%
 - **B** the salary of a part-time worker who earns \$6.50 an hour for working *n* hours
 - **C** the distance traveled by a car at an average speed of 35 miles per hour for *t* hours
 - **D** the area of a square given the length of one side
- **2** Which of the following situations can be represented by the graph of a linear function?
 - **F** the vertical distance traveled by an elevator over the course of a 24-hour period
 - **G** the position of a hook in the air at the end of a fishing line as it is thrown into the water during the course of several casts
 - **H** the horizontal distance traveled by a golf ball with respect to the time it is driven from a tee
 - J the height of a basketball with respect to the time it is thrown toward the basket

- **3** Identify the situation that CANNOT be represented by a linear function.
 - A the width of a swimming pool given the number of depth markers on the side
 - **B** the height of a ladder given the number of rungs
 - **C** the length of a fence given the number of posts
 - **D** the length of a sidewalk given the number of concrete slabs
- **4** Which problem situation can be represented by a linear function?
 - **F** the volume of a sphere with respect to the radius
 - **G** the cost to attend a concert based on the number of people who bought tickets at \$40 each
 - **H** the height of a kite that gains and loses altitude from 80 feet to 100 feet in the air
 - **J** the price of a barrel of oil over a period of 6 months
- **5** What situation is most likely to be represented by a linear function?
 - A the number of words written with respect to the time it takes to write a full-length novel
 - **B** the number of words written with respect to the time it takes to write a high school essay
 - **C** the number of words typed with respect to the time it takes to write an e-mail
 - **D** the number of words read with respect to the time it takes to read a novel
OBJECTIVE 3

A.5(C) The student is expected to use, translate, and make connections among algebraic, tabular, graphical, or verbal descriptions of linear functions.

}

Date

Read each question and choose the best answer.

1 Which function includes the following data set?

{(-7, -3), (2, 0), (11, 3)
A
$$y = x + 4$$

B $y = \frac{1}{2}x + \frac{1}{2}$
C $y = \frac{1}{3}x - \frac{2}{3}$
D $y = -\frac{1}{7}x - 4$

2 Which equation describes a line having a slope of $-\frac{3}{5}$ and a *y*-intercept of $\frac{2}{5}$? **F** 5y - 3x = 2**G** 5y + 3x = -2**H** 3y + 5x = 2

- **J** 5y + 3x = 2
- **3** The length, ℓ , and width, *w*, for 3 similar rectangles are shown in the table below.

Rectangle	Length (centimeters)	Width (centimeters)
ABCD	12	4
JKLM	15	5
WXYZ	24	8

Which function represents the relationship between the length and width of each of these rectangles?

A $\ell = 3w$

B
$$\ell = w - 3$$

C
$$\ell = \frac{1}{3}$$
W

D
$$\ell = 2.5 m$$

4 What equation is best represented by the following graph?



5 Which graph best represents the function? y = 3.25x - 4?



OBJECTIVE 3

A.6(A) The student is expected to develop the concept of slope as rate of change and determine slopes from graphs, tables, and algebraic representations.

Read each question and choose the best answer.

1 What is the slope of the line containing the points shown in the table?

x	y
-6	17
1	3
7	-9



2 Each table below lists ordered pairs of numbers. Which table identifies points contained in a line with a slope of 4?

F	x	2	4	10	15
	у	4	12	36	56
~					
G	x	4	12	36	56
	у	2	4	10	15
н	x	2	4	10	15
	у	-4	2	6	26
-					
J	x	-15	-10	-4	-2
	у	4	12	36	56
J	x y	-15 4	-10 12	-4 36	—2 56

3 Which equation has a slope of $-\frac{5}{4}$?

$$4 \quad 5x - 4y = 16$$

B 5y - 4x = 16

C
$$4y + 5x = 16$$

D
$$4x - 5y = 16$$

4 What is the rate of change of the graph below?



- **5** What is the approximate slope of a trail that has a horizontal length of 3.5 kilometers, and a gradual increase in elevation of 450 meters over the length of the trail?
 - **A** 0.13
 - **B** 0.45
 - **C** 3.5
 - **D** 7.78
- **6** What is the slope of the line with an x-intercept of 2.5 and a y-intercept

- G
- Н

OBJECTIVE 3

A.6(B) The student is expected to interpret the meaning of slope and intercepts in situations using data, symbolic representations, or graphs.

Read each question and choose the best answer.

1 The line segment on the graph shows the distance Samantha must travel from the time she leaves home to the time she reaches her destination. Which of the following best describes the slope of the line segment?



- **A** Samantha is driving 60 km/h.
- **B** Samantha is driving 55 km/h.
- **C** Samantha is driving 50 km/h.
- **D** Samantha is driving 45 km/h.
- **2** The data in the table below represents measurements taken by a contractor who wants to ensure that the angle of the roof is consistent. What is the meaning of the results?

Length (ft)	Height (ft)
0	0
4	2.2
9	4.95
13	7.15

- **F** The slope of the roof is 55%.
- **G** The slope of the roof is 35%.
- **H** The slope of the roof is 2.2.
- **J** The slope of the roof is 1.8.

3 The height of an airplane is tracked from the moment it lowers its landing gear to the time the wheels touch the runway. Which of the following coordinates is a possible representation of the *y*-intercept?

Α	(120, 0)	C (-120, 0)
В	(0, 120)	D (0, -120)

- **4** A gondola carries skiers from an elevation of 650 feet to an elevation of 820 feet within a span of 90 seconds. Which of the following best describes the slope of the linear equation that represents this functional relationship?
 - **F** The gondola travels 200 feet in 90 seconds.
 - **G** The gondola travels 170 feet in 60 seconds.
 - **H** The rate of ascent is 1.89 feet per second.
 - **J** The rate of descent is 1.89 feet per second.
- **5** Which of the following situations does NOT have an *x*-intercept when the linear equation is graphed?
 - A Brody repays his \$2000 loan with equal monthly payments of \$250.
 - **B** Tanya earns 3% commission on every unit that she sells.
 - **C** Marcus walks 3 kilometers home from the grocery store at a rate of 120 meters per minute.
 - **D** Sheree begins her ascent of a mountain that is 800 meters above sea level from a plateau that is 200 meters above sea level.

OBJECTIVE 3

A.6(C) The student is expected to investigate, describe, and predict the effects of changes in m and b on the graph of y = mx + b.

Read each question and choose the best answer.

1 What will happen to the slope of line *m* if the line is shifted so that the *y*-intercept increases and the *x*-intercept remains the same?



- **A** The slope will increase.
- **B** The slope will decrease.
- **C** The slope will change from positive to negative.
- **D** The slope will change from negative to positive.
- **2** How would the graph of y = 4x + 8 change if the value of *m* were changed to -4?
 - **F** The slope would change from negative to positive.
 - **G** The slope would change from positive to negative.
 - **H** The graph becomes steeper.
 - **J** The graph becomes less steep.
- **3** How would the graph of $y = \frac{3}{4}x 3$ change if the value of *b* were changed to 4?
 - **A** The line would move 7 units to the left.
 - **B** The line would move 7 units to the right.
 - **C** The line would move 7 units down.
 - **D** The line would move 7 units up.

4 What would happen to the slope of line *w* if the line shifts so that the *y*-intercept decreases and the *x*-intercept remains the same?



- **F** The slope would change from positive to negative.
- **G** The slope would change from negative to positive.
- ${\boldsymbol{\mathsf{H}}}$ The slope would decrease.
- **J** The slope would increase.
- **5** Consider the linear equation with *x*-intercept 4 and *y*-intercept –2. How would the slope of the line change if the *x*-intercept remained the same and the *y*-intercept changed to 2?
 - **A** The graph would become steeper.
 - **B** The graph would become less steep.
 - **C** The slope would change from positive to negative.
 - **D** The slope would change from negative to positive.
- **6** What would happen to the graph of the line $y = \frac{1}{3}x 3$ if the value of *m* changed to 3?
 - **F** The slope would change from positive to negative.
 - **G** The slope would change from negative to positive.
 - $\boldsymbol{\mathsf{H}}\xspace$ The slope would increase.
 - **J** The slope would decrease.

OBJECTIVE 3

A.6(D) The student is expected to graph and write equations of lines given characteristics such as two points, a point and a slope, or a slope and *y*-intercept.

Read each question and choose the best answer.

- **1** Which equation describes a line that has a *y*-intercept of $\frac{4}{3}$ and a slope of 3?
 - **A** $y = \frac{4}{3}x + 3$ **B** $y = \frac{4}{3}x - 3$ **C** $y = 3x + \frac{4}{3}$ **D** $y = 3x - \frac{4}{3}$
- **2** What is the equation of the line shown in the graph below?



F
$$y = \frac{5}{4} - \frac{1}{4}x$$

G $y = \frac{3}{4} - \frac{3}{4}x$
H $y = \frac{1}{2} - \frac{3}{2}x$
J $y = \frac{1}{4} - \frac{5}{4}x$

- **3** Determine the equation of the line with slope of -2.5 that passes through the point at (3.5, -1.5). **A** 4y + 10x = 29
 - **B** x + y = 2

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- **C** 10x 4y = 29
- **D** 6x 8y = 33
- **4** What is the equation of the line that passes through the points at (-6, 2) and (1, 4)?
 - **F** 2y 7x = 1 **G** 3x - 2y = -22 **H** 4x + y = 26**J** 7y - 2x = 26
- **5** Which equation describes the line that passes through the point at (-3, 1) and is perpendicular to the line represented by the equation y + 4x = -5?

A
$$y = -4x - 11$$

B $y = -\frac{1}{4}x + \frac{1}{4}$
C $y = \frac{1}{4}x + \frac{7}{4}$
D $y = 4x + 13$

6 Which equation describes the line that passes through the point at (3, 5) and is parallel to the line represented by the equation y - 2x = 5?

F
$$y = 3x - 4$$

G $y = 2x - 1$
H $y = x + 2$
J $y = \frac{1}{2}x + \frac{7}{2}$

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OBJECTIVE 3

A.6(E) The student is expected to determine the intercepts of the graphs of linear functions and zeros of linear functions from graphs, tables, and algebraic representations.

Read each question and choose the best answer.

1 Which coordinate points represent the *x*- and *y*-intercepts of the graph shown below?



- **A** (0, 2) and (3, 0)
- **B** (3, 0) and (2, 0)
- **C** (3, 0) and (0, 2)
- **D** (2, 0) and (0, 3)
- **2** Which coordinate points of the *x* and *y*-intercepts represent the linear function 5x + 2y = 15?
 - **F** (0, 7.5) and (0, 3)
 - **G** (7.5, 0) and (0, 3)
 - **H** (3, 0) and (7.5, 0)
 - **J** (3, 0) and (0, 7.5)

3 Which coordinate points represent the *x*- and *y*-intercepts of the linear function y = -3x - 5?

A (-5, 0) and
$$\left(0, -\frac{5}{3}\right)$$

B (-5, 0) and $\left(-\frac{5}{3}, 0\right)$
C $\left(-\frac{5}{3}, 0\right)$ and $(0, -5)$

D
$$\left(-\frac{5}{3}, 0\right)$$
 and $(-5, 0)$

4 What is the *y*-intercept of the linear function based on the data in the table below?

X	y
-1	10
1	2
3	-6

F	(0, 6)	Η ((1.5, 0)
G	(0, 1.5)	J ((6, 0)

5 What is the *x*-intercept of the function graphed below?



6 What are the *x*- and *y*-intercepts of the linear function according to the data in the table below?

x	у
-2	-10
4	5
6	10

- **F** (-5, 0) and (2, 0)
- **G** (-5, 0) and (0, 2)
- **H** (2, 0) and (0, −5)
- **J** (2, 0) and (-5, 0)

OBJECTIVE 3

A.6(F) The student is expected to interpret and predict the effects of changing slope and *y*-intercept in applied situations.

Read each question and choose the best answer.

- 1 Frank works out at a rock climbing gym. His progress can be graphed according to the linear equation y = 50 + 2.5x, where x is measured in seconds and y is measured in feet. What happens when the slope is changed to -5?
 - A Frank climbs down the wall at half the speed he climbed up the wall.
 - **B** Frank climbs down the wall at twice the rate he climbed up the wall.
 - **C** Frank climbs up the wall at twice the speed he climbed down the wall.
 - **D** Frank climbs down the wall at the same speed he climbed up the wall.
- **2** Fara places a racing car at the top of a piece of wood and times how long it takes the car to reach the bottom of the ramp when one end is raised to a height of 5 feet. What happens when the *y*-intercept is changed to 6?
 - **F** The speed of the racing car decreases.
 - **G** The speed of the racing car increases.
 - ${\bf H}~$ The length of the slope increases.
 - **J** The length of the slope decreases.
- **3** The Sealy News offers subscription rates to residents of Austin County of \$39.00 per year. What would change in the graph of the linear equation that represents revenue earned from subscription sales if the rate were changed to \$19.50 for 6 months?
 - **A** The slope would increase.
 - **B** The slope would decrease.
 - **C** The line would decrease in length.
 - **D** The slope would remain the same.

- **4** Linh works in the clothing department where she earns \$9.50 an hour. How will the graph of the linear equation change if her hourly rate is decreased to \$7.85 an hour and she receives a weekly base payment of \$200.00?
 - **F** The *y*-intercept will move down and the slope will increase.
 - **G** The *y*-intercept will move down and the slope will decrease.
 - **H** The *y*-intercept will move up and the slope will decrease.
 - **J** The *y*-intercept will move up and the slope will increase.
- **5** What happens in the graph of the linear equation below when the slope is changed to 1.5?



- A Earnings will decrease.
- **B** Earnings will increase.
- **C** Base pay will increase.
- **D** Base pay will decrease.

OBJECTIVE 3

A.6(G) The student is expected to relate direct variation to linear functions and solve problems involving proportional change.

Read each question and choose the best answer.

1 Patricia sells collectible mugs through her Web site Mugs.com and tracks her sales in the table below.

Mugs Sold	Revenue
45	\$146.25
112	\$364.00
256	\$832.00

If Patricia continues to sell mugs at the same price, how much will she earn if she sells 2500 mugs?

- **A** \$7250
- **B** \$7950
- **C** \$8125
- **D** \$8725
- **2** Which linear equation will increase 5 times as fast as y = 3 + 2x?
 - **F** y = 15 + 2x
 - **G** 3y = 3 + 2x
 - **H** y = 15 + 10x
 - **J** y = 3 + 5x
- **3** For 50 weekends of the year, Corinna sells bamboo plants at the flea market. Over the course of one year she sells 2400 bamboo plants. If she sells the same number of plants per day, how many plants would she sell in 12 weekends?
 - **A** 144
 - **B** 288
 - **C** 396
 - **D** 576

- **4** If Alexis earns \$775 for selling \$3500 of merchandise and \$1225 for selling \$6500 of merchandise, how much will she earn if she sells \$15,000 in merchandise?
 - **F** \$1900
 - **G** \$2100
 - **H** \$2300
 - **J** \$2500
- **5** The Texas Motor Speedway is 1.5 miles long. The time to complete a number of laps during a practice round is shown below.

Lap No.	Time (sec)
1	28.06
2	56.12
3	84.18
4	112.24

If the driver continues at this pace for 35 laps, how long will it take?

- **A** 12 min 42 sec
- **B** 16 min 22 sec
- **C** 20 min 32 sec
- **D** 22 min 16 sec

6 A drilling machine can drill through igneous rock at a rate of 1 meter every 155 seconds. If the drilling machine continues at the same rate, about how long will it take to reach a depth of 55 meters?

- **F** 2 h 22 min
- **G** 2 h 36 min
- **H** 2 h 48 min
- **J** 3 h 0 min

TAKS Practice

OBJECTIVE 4

A.7(A) The student is expected to analyze situations involving linear functions and formulate linear equations or inequalities to solve problems.

Read each question and choose the best answer.

 Thomas planted several seeds in a number of pots placed in his garden. The table shows the number of seedlings that sprouted compared to the number of pots.

No. of Pots	No. of Seedlings
1	9
2	12
3	15
4	18

Which equation best describes the relationship between *n*, the number of seedlings, and *p*, the number of pots?

- **A** n = 2p + 7 **B** n = 3p + 6**C** n = 4p + 5
- **D** n = 9p

2 Sierra is having a barbecue with her friends. She purchases a tank of propane for \$20.00 and several packs of chicken. Each pack costs less than \$9.95 each. Which equation could be used to determine *C*, the maximum cost of purchasing the propane tank and *n* packs of chicken?

F C > 20 + 9.95n

- **G** $C \ge 20 + 9.95n$
- **H** C < 20 + 9.95n
- **J** $C \le 20 + 9.95n$

3 Alicia was given a puppy that weighed 5 pounds. The puppy gained at most 3 pounds per month. Which inequality represents the puppy's weight, *y*, in terms of the number of months, *x*, that Alicia has owned it?

$$A \quad y \le 3x + 5$$

B $y \ge 3x + 5$ **C** y < 3x - 5

L
$$y \le 3x - 5$$

D $y \ge 3x - 5$

4 A shaded triangle is graphed on the coordinate grid below.



Which of the following functions describes a line that would include an edge of the shaded triangle?

F
$$y = -1.5 - 3x$$

G $y = 0.5x + 1.5$
H $y = 1.5 - 3x$
J $y = 1.5 - 0.5x$

OBJECTIVE 4

A.7(B) The student is expected to investigate methods for solving linear equations and inequalities using concrete models, graphs, and the properties of equality, select a method, and solve the equations and inequalities.

Read each question and choose the best answer.

1 The graph of the linear equation y = 2 - 5x is shown below.



Which point is in the solution set $x \in 2^{-5}$

- y < 2 5x?
- **A** (0, 1.5)
- **B** (1, -2)
- **C** (1,3)
- **D** (1.5, 0)
- **2** Which point is NOT in the solution set of $y \le \frac{4}{3} \frac{1}{3}x$?
 - **F** (-4.5, -4.5)
 - **G** (-2.5, 1.5)
 - **H** (2.5, 1.5)
 - **J** (3.5, -2.5)
- **3** If (6, y) is a solution to the equation 5x 7y = -19, what is the value of y?
 - **A** 6
 - **B** 7
 - **C** 8
 - **D** 9

- **4** If (x, 3) is a solution to the equation -9x + 4y = -15, what is the value of x?
 - **F** 0 **G** 1
 - **H** 2
 - **J** 3
- **5** What is the solution to the linear equations

$$y = \frac{8}{5}x - \frac{16}{5} \text{ and } y = \frac{4}{5} - \frac{12}{5}x^{4}$$

$$A \ \left(-1, -\frac{24}{5}\right)$$

$$B \ \left(0, -\frac{16}{5}\right)$$

$$C \ \left(1, -\frac{8}{5}\right)$$

$$D \ (2, 0)$$

6 The graphs of the linear equations
$$y = 3x - 1$$
 and $y = 2 - 4x$ are shown below.



Which of the following points falls between the *y*-axis and both functions?

- **F** (0.25, 0.25)
- **G** (0.5, 0.5)
- **H** (0.75, 0.25)
- **J** (0.75, 0.75)

OBJECTIVE 4

A.7(C) The student is expected to interpret and determine the reasonableness of solutions to linear equations and inequalities.

Read each question and choose the best answer.

- **1** In 2001, a high school had an enrollment of 1400 students. In 2005, enrollment increased to 1725 students. If the enrollment continued to increase at the same rate, what would be a reasonable projection for enrollment in 2012?
 - **A** 1925
 - **B** 2098
 - **C** 2144
 - **D** 2294
- **2** Rita believes that in order to reach her goal of raising \$10,000 for charity, she will have to sell 1400 charm necklaces. If she has already earned \$1800, how many more necklaces will she reasonably have to sell to achieve her goal?
 - **F** 1110
 - **G** 1148
 - **H** 1205
 - **J** 1255
- **3** Donovan is 1 month into his goal of reading at least 1 book per week, where each book has at least 150 pages. What is a reasonable number of pages that Donovan will have read by the end of 6 months?
 - **A** 3700
 - **B** 3900
 - **C** 4100
 - **D** 4300

- **4** Tom Bommer's Bagels has a customer service motto that every coffee and bagel order will be served within 90 seconds. How many orders can the bagel chain reasonably serve in a 24-hour period?
 - **F** 860
 - **G** 960
 - **H** 1060
 - **J** 1160
- **5** Curtis practices for the 110-meter hurdles by doing sprints on a 400-meter track. His average speed is 13.4 seconds for each 100-meter sprint session. He also runs endurance sessions around the entire track, which he completes in an average time of 61.2 seconds. If he maintained the same pace, how much longer would it take him to run 4 kilometers at his endurance training speed than to run at his sprint training speed?
 - **A** 76 sec
 - **B** 86 sec
 - **C** 96 sec
 - **D** 106 sec
- **6** In 1950, the town of Texasville registered 7840 residents. Ten years later, that number increased to 10,430. If this trend continues, how many residents will they reasonably have in 2005?
 - **F** 22,085
 - **G** 23,430
 - **H** 24,580
 - **J** 25,245

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OBJECTIVE 4

A.8(A) The student is expected to analyze situations and formulate systems of linear equations in two unknowns to solve problems.

Read each question and choose the best answer.

1 Mike and Lisa went to the supermarket. Mike bought 3 cans of tomato sauce and 5 boxes of spaghetti for a total of \$8.55. Lisa bought 6 cans of tomato sauce and 4 boxes of spaghetti for a total of \$9.90. Which system of equations could be used to determine the cost of 1 can of tomato sauce, *t*, and 1 box of spaghetti, *s*?

A
$$3t + 4s = 8.55$$

$$6t + 5s = 9.90$$

B $3t + 6s = 8.55$

$$5t + 6s = 8.55$$

 $5t + 4s = 9.90$

- **C** 3t + 5s = 9.90
- 6t + 4s = 8.55
- **D** 3t + 5s = 8.556t + 4s = 9.90
- **2** The Schlitterbahn Beach Waterpark on South Padre Island sells two-day admission tickets for people who plan to spend more than one day enjoying the facilities. Tickets are \$49.94 for adults and \$40.38 for children. A tour group consists of 24 people and pays \$1122.08. Which system of equations could be used to find the number of adults, *a*, and children, *c*, in the tour group?

F
$$a + c = 24$$

 $49.94c + 40.38a = 1122.08$
G $a + c = 24$
 $49.94a + 40.38c = 1122.08$
H $a = c + 24$
 $49.94a + 40.38c = 1122.08$

J
$$49.94a + 40.38c = 24$$

 $a + c = 1122.08$

- **3** The Language Loft offers courses for people who want to become fluent in another language. The introductory French course is 8 classes and costs \$250. The intermediate French course is 14 classes and costs \$370. A one-day testing and orientation session for all language courses is included in the cost. Which system of equations represents both the cost per class, *c*, and the orientation fee, *f*, for both of these courses?
 - **A** 8f + c = 250

$$14c + f = 370$$

B
$$8c + f = 250$$

 $14f + c = 370$

C
$$8c + f = 250$$

 $14c + f = 370$

- **D** 8c + f = 37014c + f = 250
- **4** The Sports Store is selling 5 packs of baseball cards with a poster for \$17.45. The store also sells a 36-pack box of baseball cards, with a poster, for \$63.95. Which system of equations could be used to determine both the cost per pack of baseball cards, *c*, and the poster, *p*?
 - **F** c + 5p = 17.4536c + p = 63.95
 - **G** 5c + p = 17.45c + 36p = 63.95
 - **H** 5c + p = 63.9536c + p = 17.45
 - **J** 5c + p = 17.4536c + p = 63.95

TAKS Practice

OBJECTIVE 4

A.8(B) The student is expected to solve systems of linear equations using concrete models, graphs, tables, and algebraic methods.

Read each question and choose the best answer.

1 What is the *x*-coordinate of the solution to the system of linear equations below?

$$3x + 2y = 12$$
$$4x - 3y = 16$$

- **A** 4 **B** 3
- **C** 2
- **D** 1
- **2** The graph of the linear equation y = 2x 4 is shown.



If the linear equation y = x + 1 is plotted on the graph, what would be the solution to the system of equations?

- **F** (3, 4)
- **G** (4, 3)
- **H** (4, 5)
- **J** (5, 6)

3 Determine the solution to the system of linear equations identified in the table of values below.

x	y ₁	y ₂
-2	-2	11
_1	2	9
0	6	7
1	10	5

Α	$\left(\frac{1}{6}, \frac{20}{3}\right)$
В	$\left(\frac{1}{3}, \frac{20}{3}\right)$
С	$\left(\frac{1}{6}, \frac{10}{3}\right)$
D	$\left(\frac{1}{3}, \frac{10}{3}\right)$

4 What is the *y*-coordinate of the solution to the system of linear equations below?

$$5y + 4x = 10 2x - 5y = 20$$

F -1
H -3
G -2
J -4

5 What are the coordinates of the solution to the system of linear equations

$$y = \frac{3}{5}x - 4 \text{ and } y = 2 - \frac{2}{5}x?$$

A $(6, \frac{2}{5})$
B $(6, -\frac{2}{5})$
C $(\frac{2}{5}, 6)$
D $(\frac{2}{5}, -6)$

OBJECTIVE 4

A.8(C) The student is expected to interpret and determine the reasonableness of solutions to systems of linear equations.

Read each question and choose the best answer.

- Luis went to the bank to cash a \$200 check. He asked for \$20 and \$50 bills. He received a total of 7 bills. How many \$20 bills did he receive?
 - **A** 3
 - **B** 4
 - **C** 5
 - **D** 6
- 2 Courier A charges \$0.30 per kilometer plus a \$7.00 package fee for all deliveries. Courier B charges \$0.20 per kilometer plus an \$8.50 package fee for all deliveries. At what distance would it become more economical to use Courier B?
 - **F** 12 km
 - **G** 13 km
 - **H** 14 km
 - **J** 15 km
- **3** Margie goes shopping one week and buys 3 jars of olives and 5 packages of Swiss cheese for \$19.12. The next time she goes shopping, she purchases 2 jars of olives and 3 packages of Swiss cheese for \$11.63. How much did she pay for each jar of olives?
 - **A** \$0.79
 - **B** \$0.97
 - **C** \$3.35
 - **D** \$3.53

- **4** Admission to the Dallas Museum of Art is \$10 for adults and \$5 for students. During one exhibition, the museum admitted 55 more adults than students and took in \$4600. How many adults came to the exhibition?
 - **F** 305
 - **G** 315
 - **H** 325
 - **J** 335
- **5** Round-trip bus tickets from Austin to Dallas are \$35.50 for adults and \$22.50 for students. There are 110 passengers on the bus and the total ticket sales are \$3450. How many students are likely on the bus?
 - **A** 25
 - **B** 35
 - **C** 45
 - **D** 55

6 Anne owns 16 pairs of shoes. The number of pairs of dress shoes is 2 less than twice the number of pairs of casual shoes. How many pairs of dress shoes does she own?

- **F** 10
- **G** 9
- **H** 8
- **J** 7

TAKS Practice

OBJECTIVE 5

A.9(B) The student is expected to investigate, describe, and predict the effects of changes in a on the graph of $y = ax^2 + c$.

Read each question and choose the best answer.

- **1** What is the effect on the graph of the equation $y = 3x^2$ when the equation is changed to $y = -3x^2$?
 - **A** The graph of $y = 3x^2$ is translated 6 units down.
 - **B** The graph of $y = 3x^2$ is translated 6 units up.
 - **C** The graph of $y = -3x^2$ is a reflection of $y = 3x^2$ across the *x*-axis.
 - **D** The graph of $y = -3x^2$ is a reflection of $y = 3x^2$ across the *y*-axis.
- **2** What is the effect on the graph of the equation $y = 2x^2$ when the equation is changed to $y = 5x^2$?
 - **F** The graph of $y = 2x^2$ becomes wider.
 - **G** The graph of $y = 2x^2$ becomes narrower.
 - **H** The graph of $y = 2x^2$ is translated 3 units left.
 - **J** The graph of $y = 2x^2$ is translated 3 units right.
- **3** How will the graph of $y = ax^2$ be affected if the coefficient becomes a number greater than 2?
 - **A** The graph will be narrower.
 - **B** The graph will be wider.
 - **C** The graph will remain the same but the graph will move up by the value of the coefficient.
 - **D** The graph will change direction.

- **4** How will the graph of $y = ax^2$ be affected if the coefficient becomes a number greater than 0 but less than 1?
 - **F** The graph will change from positive to negative.
 - **G** The graph will change direction.
 - **H** The graph will be narrower.
 - **J** The graph will be wider.
- **5** What is the effect on the graph of the equation $y = -4x^2$ when the equation is changed to $y = -3x^2$?
 - **A** The graph of $y = -4x^2$ is translated 1 unit up.
 - **B** The graph of $y = -4x^2$ is translated 1 unit down.
 - **C** The graph of $y = -4x^2$ becomes narrower.
 - **D** The graph of $y = -4x^2$ becomes wider.
- **6** What is the effect on the graph of the equation $y = 5x^2$ when the equation is changed to $y = -4x^2$?
 - **F** The graph of $y = 5x^2$ is reflected in the *x*-axis and narrowed.
 - **G** The graph of $y = 5x^2$ is reflected in the *x*-axis and widened.
 - **H** The graph of $y = 5x^2$ is moved 9 units down.
 - **J** The graph of $y = 5x^2$ is reflected in the *x*-axis and moved 9 units up.

TAKS Practice

OBJECTIVE 5

A.9(C) The student is expected to investigate, describe, and predict the effects of changes in c on the graph $y = ax^2 + c$.

Read each question and choose the best answer.

- **1** How do the graphs of the functions $f(x) = x^2 3$ and $g(x) = x^2 + 1$ relate to each other?
 - **A** The graph of f(x) is 4 units above the graph of g(x).
 - **B** The graph of f(x) is 4 units below the graph of g(x).
 - **C** The graph of f(x) is 4 units to the left of the graph of g(x).
 - **D** The graph of f(x) is 4 units to the right of the graph of g(x).
- **2** The graph of *f*(*x*) is shown below. What value of *c* will move the graph up 3 units?



- **3** Which function is 5 units above the graph of $y = x^2 + 2$?
 - **A** $y = x^2 + 7$ **B** $y = x^2 + 5$ **C** $y = x^2 - 3$
 - **D** $y = x^{2} 5$

- **4** How do the graphs of the functions $h(x) = x^2 6$ and $j(x) = x^2 8$ relate to each other?
 - **F** The graph of h(x) is 2 units to the left of the graph of j(x).
 - **G** The graph of h(x) is 2 units to the right of the graph of j(x).
 - **H** The graph of h(x) is 2 units below the graph of j(x).
 - **J** The graph of h(x) is 2 units above the graph of j(x).
- **5** How does the graph of $y = x^2 + 1$ differ from the graph of $y = x^2$?
 - **A** The graph of $y = x^2$ is narrower than the graph of $y = x^2 + 1$.
 - **B** The graph of $y = x^2$ is wider than the graph of $y = x^2 + 1$.
 - **C** The graph of $y = x^2$ is shifted down from the graph of $y = x^2 + 1$.
 - **D** The graph of $y = x^2$ is shifted up from the graph of $y = x^2 + 1$.
- **6** How does the graph of $y = x^2$ differ from the graph of $y = x^2 + 3$?
 - **F** The graph of $y = x^2 + 3$ is shifted up from the graph of $y = x^2$.
 - **G** The graph of $y = x^2 + 3$ is shifted down from the graph of $y = x^2$.
 - **H** The graph of $y = x^2 + 3$ is wider than the graph of $y = x^2$.
 - **J** The graph of $y = x^2 + 3$ is narrower than the graph of $y = x^2$.

TAKS Practice

OBJECTIVE 5

A.9(D) The student is expected to analyze graphs of quadratic functions and draw conclusions.

Read each question and choose the best answer.

1 A projectile is launched from a platform overlooking a field. The graph below shows *h*, the height in meters of a projectile, versus *t*, the time in seconds after the ball is thrown into the air. From the graph, which conclusion can be made about the flight of the projectile?



- A The projectile reaches its peak at 4 seconds.
- **B** The projectile takes 7 seconds to hit the ground after being launched.
- **C** The projectile is launched from a height of 3 m.
- **D** The projectile is launched from a height of 0 m.

2 The graph below shows *h*, the height in meters of an air-pumped rocket, versus *t*, the time in seconds after the rocket is launched into the air. From the graph, which conclusion can be made about the flight of the rocket?



- **F** It takes more than 1 second before the rocket is launched into the air.
- **G** The rocket is in the air for more than 9 seconds.
- **H** The rocket reaches its peak in 4 seconds.
- J The rocket is launched from a height of 1 meter.
- **3** Braking distance for a motorcycle is a quadractic function of initial speed.



Which conclusion can be made from the graph if initial speed is doubled?

- **A** Braking distance will be four times as long.
- **B** Braking distance will be twice as long.
- **C** Braking distance will be three times as long.
- **D** Braking distance will be $1\frac{1}{2}$ times as long.

OBJECTIVE 5

A.10(A) The student is expected to solve quadratic equations using concrete models, tables, graphs, and algebraic methods.

Read each question and choose the best answer.

- **1** What are the solutions to the quadratic equation $x^2 x 12 = 0$?
 - **A** x = -3, x = -4**B** x = -3, x = 4
 - **C** x = 3, x = 4
 - **D** x = 3, x = -4
- **2** Determine the solutions to the quadratic equation based on the data in the table below.

1		
	x	y
	0	15
	1	4
	2	-3
	3	-6
	4	-5

F
$$x = 1.5, x = -5$$

G $x = -1.5, x = -5$
H $x = 1.5, x = 5$
J $x = -1.5, x = 5$

3 What are the roots of the quadratic function graphed below?



4 What are the roots to the quadratic function $y = 6x^2 - 25x + 25$?

F
$$x = -\frac{5}{3}, x = \frac{5}{2}$$

G $x = \frac{5}{3}, x = \frac{5}{2}$
H $x = -\frac{5}{3}, x = -\frac{5}{2}$
J $x = \frac{5}{3}, x = -\frac{5}{2}$

5 Determine the solutions to the quadratic equation based on the data in the table below.

x	У
-4	16
-3	6
-1	-2
1	6
2	16

A
$$x = 0, x = -2$$

B $x = 0, x = 2$
C $x = 0$
D $x = -2$

6 What are the roots to the quadratic function shown in the graph below?



F
$$x = 6$$

G $x = 0$
H $x = 0, x = -6$
J $x = 0, x = 6$

OBJECTIVE 5

A.10(B) The student is expected to make connections among the solutions (roots) of quadratic equations, the zeros of their related functions, and the horizontal intercepts (*x*-intercepts) of the graph of the function.

Read each question and choose the best answer.

1 What are the roots of the function graphed below?



- **A** x = -2 and x = 0
- **B** x = -1.75 and x = 0
- **C** x = 3.5 and x = 0
- **D** x = -3.5 and x = 0
- **2** What are the roots of the quadratic function $y = x^2 8x + 15$?
 - **F** x = 4 and x = 3
 - **G** x = 3 and x = 5
 - **H** x = 3 and x = 0
 - **J** x = 5 and x = 0
- **3** What are the roots of the revenue function R(x) = (100 x)(90 0.85x)? **A** x = 100 and x = 105.88 **B** x = 100 and x = 76.5
 - **C** x = 100 and x = 70.
 - **D** x = 100 and x = .85

4 What are the roots of the quadratic function graphed below?



- **F** x = 1 and x = 5 **G** x = 0 and x = 3 **H** x = 1 and x = 0**J** x = 0 and x = -5
- **5** What are the roots of the quadratic function $y = 2x^2 + 1$?
 - **A** x = 1 and x = 0
 - **B** x = -1 and x = 0
 - **C** x = -2 and x = 2
 - **D** There are no real roots.
- 6 What are the roots of the quadratic function y = -x² + 4x + 5?
 F x = 1 and x = -5
 G x = 1 and x = 5
 H x = -1 and x = -5
 J x = -1 and x = 5

TAKS Practice

OBJECTIVE 5

A.11(A) The student is expected to use patterns to generate the laws of exponents and apply them in problem-solving situations.

Read each question and choose the best answer.

- **1** Which expression represents the product of $(3x^3y^2z)^3(2x^{-2}y^3z^2)$?
 - **A** $54x^7y^9z^5$
 - **B** $54x^7y^6z^4$
 - **C** $54x^{11}y^9z^5$
 - **D** $54x^9y^7z^5$
- **2** Which expression is equivalent to

 $\frac{16x^{3}y^{-2}}{4x^{4}y^{-3}}$ $F \quad \frac{4y}{x^{2}}$ $G \quad \frac{4y^{2}}{x}$ $H \quad \frac{4y}{x}$

- **J** 4xy
- **3** Which expression is equivalent to



D $\frac{6x}{y^2}$

4 Which expression is equivalent to $36x^{-3}y^{-4}z^{-2}$

$$9x^{-5}y^{-8}z^{-4}$$
F $\frac{4y^4z^2}{x^2}$

G
$$4x^2y^4z^2$$

$$H \frac{4x^2z^2}{y^4}$$
$$J \frac{4x^2y^4}{z^2}$$

5 Which expression is equivalent to $(5x^2y^2z^3)^2(8x^3y^4)_2$

$$\frac{(exy)^2 y^7 (exy)^7}{4x^2 y^5 z}$$
A 100x⁷y³z⁶
B 50x⁹y³z⁶
C 50x⁵y³z⁶

- **D** $50x^5y^3z^5$
- **6** Which expression is equivalent to $(4x^2y^3z^6)^2(3x^{-3}y^{-4}z^{-8})?$
 - **F** $48x^7y^2z^3$
 - **G** $48xy^2z^3$
 - **H** $48xyz^4$
 - **J** $48xy^2z^4$

OBJECTIVE 6

8.6(A) The student is expected to generate similar figures using dilations including enlargements and reductions.

Read each question and choose the best answer.

1 The graph shows $\triangle ABC$ with vertices $A(1, 3), B(3, 1), \text{ and } C(4, 5) \text{ and } \overline{WY}$ with endpoints W(4, 7) and Y(8, 3).



At what coordinates would *X* be placed to create $\triangle WYX$, a triangle similar to $\triangle ABC$?

- **A** (11, 10)
- **B** (10, 11)
- **C** (9, 8)
- **D** (8, 9)
- **2** Consider the following diagram.



The triangle is dilated such that the perimeter of the new triangle is 82.4 centimeters. What is the length of the missing side in the new triangle?

- **F** 32.0 cm
- **G** 31.6 cm
- **H** 29.8 cm
- **J** 28.0 cm





Which of the following shows $\triangle KLM$ dilated by a scale factor of $\frac{5}{4}$ to create a similar triangle $\triangle PQR$?



OBJECTIVE 6

8.6(B) The student is expected to graph dilations, reflections, and translations on a coordinate plane.

Read each question and choose the best answer.

1 At what coordinates should vertex *F* be placed to create $\triangle DEF$ that is similar to $\triangle ABC$?



- **A** (5, 1)
- **B** (5, 3)
- **C** (5, 5)
- **D** (5, 4)
- **2** If quadrilateral *JKLM* is reflected across the *y*-axis to become quadrilateral *J'K'L'M'*, what will be the coordinates of *M'*?



- **F** (-4, 3)
- **G** (4, 3)
- **H** (4, -3)
- **J** (-4, -3)

3 $\triangle XYZ$ is shown on the coordinate grid below.



If $\triangle XYZ$ is translated so that point *X* is on the *y*-axis and point *Y* is at (5, -3), what will be the new coordinates of point *Z*?

- **A** (1, −8)
- **B** (0, −1)
- **C** (−1, −8)
- **D** (−8, −1)

4 Quadrilateral *QRST* is shown below.



If quadrilateral QRST is reflected in the *x*-axis and then the *y*-axis to form quadrilateral Q''R''S''T'', what will be the coordinates of T''?

- **F** (6, 4)
- **G** (6, -4)
- **H** (4, 6)
- **J** (-4, 6)

TAKS Practice

OBJECTIVE 6

8.7(D) The student is expected to locate and name points on a coordinate plane using ordered pairs of rational numbers.

Read each question and choose the best answer.

1 Which point on the grid below satisfies the conditions x > 5 and $y \le 3$?



- **A** point D
- **B** point C
- **C** point *B*
- **D** point A
- **2** \triangle *ABC* is translated so that *A*' is somewhere on the *y*-axis. Which of the following could be the coordinate of *B*'?



F (6, 3) **G** (5, 4) **H** (0, -4) **J** (-1, 3) **3** Which of the following points satisfies the conditions x < 3 and y > -2?



- **A** point W
- **B** point X
- **C** point Y
- **D** point Z
- **4** A portion of parallelogram *JKLM* is shown on the grid below.



At what coordinates should vertex *M* be placed in order to complete parallelogram *JKLM*?

- **F** (-6, -1)
- **G** (-6, 0)
- **H** (-5, -1)
- **J** (-5, 0)

OBJECTIVE 7

8.7(A) The student is expected to draw three-dimensional figures from different perspectives.

Read each question and choose the best answer.

1 The drawing shows the top view of a structure built with cubes, as well as the number of cubes in each column of the structure.



Which 3-dimensional view represents the same structure?







Which of the following is NOT a top, front or side view of the solid?









3 The side view of which solid is shown below?



- A pyramid
- **B** cube
- **C** cone
- **D** cylinder

OBJECTIVE 7

8.7(B) The student is expected to use geometric concepts and properties to solve problems in fields such as art and architecture.

Read each question and choose the best answer.

- **1** The blueprint for a new community center measures 85 centimeters long by 55 centimeters wide. If the community center is actually 45 meters long, what is the actual width of the community center?
 - **A** 22.4 m
 - **B** 27.6 m
 - **C** 29.1 m
 - **D** 34.3 m
- **2** A triangular plot of land is being converted into a park for the local community. The land has side lengths 25 feet, 15 feet, and 19 feet. Where will park benches be placed so that they can take advantage of the largest angle?
 - **F** in the center of the park
 - **G** in the corner opposite the side that is 15 ft
 - **H** in the corner opposite the side that is 19 ft
 - **J** in the corner opposite the side that is 25 ft
- **3** A football field is 360 feet long and 160 feet wide. The field needs to be widened by 65 feet in order to accommodate soccer as well. What is the area of the new field?
 - **A** 23,400 ft²
 - **B** 57,600 ft²
 - **C** 72,000 ft²
 - **D** 81,000 ft²

- **4** Sandra is putting new tile flooring in her kitchen. She measures the length and width of the floor, as well as the length and width of each open wall. She has already determined the cost per square foot of the tile she wants to purchase. Which geometric formula will Sandra use to determine the total cost of the job?
 - $F \quad A = \frac{1}{2}Bh$ $G \quad A = lw$ $H \quad P = 2l + 2w$ $J \quad V = lwh$
- **5** A circular ballroom with a diameter of 150 feet is having a square dance floor installed. The corners of the dance floor touch the edge of the circular ballroom. What is the area of the dance floor?
 - **A** 7800 ft²
 - **B** 11,250 ft²
 - **C** 17,750 ft^2
 - **D** 22,500 ft²
- **6** A 60-foot ladder is leaning against the wall of a building. The top of the ladder is touching the ledge of a window that is 45 feet off the ground. Charlie is standing $\frac{2}{3}$ up the length of the ladder. About how far is Charlie from the wall? **F** 9.2 ft
 - **G** 11.3 ft
 - **H** 13.2 ft
 - **J** 15.3 ft



8.7(C) The student is expected to use pictures or models to demonstrate the Pythagorean Theorem.

Read each question and choose the best answer.

1 A 275-foot transmission tower is stabilized by 4 guy wires that are each planted into the ground 450 feet away, as shown below. What is the approximate total length of the guy wires?



- **A** 1800.0 ft
- **B** 1993.3 ft
- **C** 2109.5 ft
- **D** 2403.3 ft
- **2** The following diagram shows the net of a box with a base in the shape of an isosceles triangle.



3 A 40-foot ladder is set against a wall. The distance of the base of the ladder from the wall is equal to the height of the ladder. About how high up the wall is the top of the ladder?



- **A** 28.3 ft **B** 31.2 ft
- **C** 32.5 ft
- **D** 33.6 ft
- **4** Sylvan is working on a sailboat that has a mast height of 18 feet. The base lengths of each sail are 12 feet and 7 feet, respectively. What is the sum of the diagonal lengths of both sails?



- **F** 32.8 ft
- **G** 35.2 ft
- **H** 37.3 ft
- **J** 40.9 ft

OBJECTIVE 8

8.8(A) The student is expected to find lateral and total surface area of prisms, pyramids, and cylinders using concrete models and nets (two-dimensional models).

Read each question and choose the best answer.

1 The net of a cylinder is shown below.



Use the ruler on the Mathematics Chart to measure the dimensions of the cylinder to the nearest tenth of a centimeter. Then find the surface area of the cylinder to the nearest tenth of a square centimeter.

Α	7.1 cm^2	С	22.4 cm ²
B	19 cm ²	D	43 cm^2

2 A cylindrical water tower has a radius of 1.85 meters and a height of 12.25 meters. What is the approximate surface area of the tower?



3 The net of a rectangular prism is shown below.



Use the ruler on the Mathematics Chart to measure the dimensions of the prism to the nearest tenth of a centimeter. Find the surface area of the prism.

Α	6.2 cm^2	С	21.4 cm ²
В	18.5 cm ²	D	43 cm^2

4 What is the surface area of the prism shown below?



OBJECTIVE 8

8.8(B) The student is expected to connect models of prisms, cylinders, pyramids, and cones to formulas for volume of these objects.

Read each question and choose the best answer.

1 What is the volume of the triangular prism shown below to the nearest tenth?



- **A** 992.7 in.³
- **B** 741.7 in.³
- **C** 598.1 in.³
- **D** 299.1 in.³
- **2** What is the volume of the pyramid below?



3 What is the volume of the air in the following cylinder if it is filled $\frac{1}{4}$ of the way with water?



- **A** 21,551.3 cm³
- **B** 16,163.5 cm³
- **C** 10,775.7 cm^3
- **D** 5387.8 cm^3
- **4** What is the volume of the cone shown below?



- **F** 588.4 in.³
- **G** 294.2 in.³
- **H** 196.1 in.³
- **J** 178.1 in.³

TAKS Practice

OBJECTIVE 8

8.8(C) The student is expected to estimate measurements and use formulas to solve application problems involving lateral and total surface area and volume.

Read each question and choose the best answer.

- **1** What is the volume of a truck's cylindrical oil tank measuring 28 feet long by 78 inches tall?
 - **A** 929.1 ft³
 - **B** 1323.3 ft³
 - **C** 1748.5 ft³
 - **D** 2184.0 ft³
- **2** An above-ground circular swimming pool has a radius of 15 feet and a height of 6 feet. What is the surface area of the material that was used to construct the pool?
 - **F** 565.5 ft³
 - **G** 1272.3 ft³
 - **H** 1979.2 ft³
 - **J** 2273.1 ft³
- **3** An aluminum can is 6.5 centimeters in diameter and 12.3 centimeters tall. The drinking hole is 2.4 centimeters in diameter. What is the surface area of the aluminum for the can?
 - **A** 308.0 cm^2
 - **B** 311.5 cm²
 - **C** 313.0 cm^2
 - **D** 317.5 cm²

- 4 A door measures 32 inches wide by 80 inches tall. The door swings out 90°. What is the volume of the space occupied by the opening of the door?
 - **F** 139.6 ft³
 - **G** 111.7 ft³
 - **H** 74.5 ft^3
 - **J** 37.2 ft³
- **5** A triangular-based pyramid is built as an architectural abutment to a building. The pyramid has a base length of 1.2 meters and a base width of 0.7 meters. The pyramid juts out 1.5 meters. What is the volume of the pyramid?
 - **A** 1.26 m²
 - **B** 0.63 m^2
 - **C** 0.42 m^2
 - **D** 0.21 m^2
- **6** A rectangular box measuring 25 centimeters wide by 25 centimeters tall by 28 centimeters long holds 1500 sheets of paper. Four hundred sheets of paper have been used for the photocopier. What is the remaining volume of the paper in the box?
 - **F** 12,833.3 cm³
 - **G** 13,822.2 cm³
 - **H** 15,555.5 cm^3
 - **J** 17,500 cm³

OBJECTIVE 8

8.9(A) The student is expected use the Pythagorean Theorem to solve real-life problems.

Read each question and choose the best answer.

- **1** The diagonal of a rectangular room is slightly longer than 18 feet. Which pair of dimensions is closest to the length and width of the room?
 - **A** 10 ft by 15 ft
 - **B** 12 ft by 12 ft
 - **C** 15 ft by 12 ft
 - **D** 16 ft by 12 ft
- **2** Mr. Delano is putting in a fence around his triangular property, which is shown in the diagram below.



If fence posts are placed 3 feet apart to support the fence, approximately how many fence posts will be used in the construction?

- **F** 36
- **G** 38
- **H** 40
- **J** 42
- **3** The Houston Grand Plaza has a ballroom that has an area of 18,000 square feet. If the ballroom is square, what is the diagonal length of the ballroom?
 - **A** 189.7 ft
 - **B** 198.7 ft
 - **C** 228.7 ft
 - **D** 237.7 ft

- **4** A 65-foot tree is cut to a level of 3 feet from the ground. The fallen tree collapses against another tree that is 18 feet away. About how far off the ground does the fallen tree touch the second tree?
 - **F** 47.8 ft
 - **G** 48.7 ft
 - **H** 53.9 ft
 - **J** 62.3 ft
- 5 Steven and Corinne each have GPS units for determining their precise positions. While starting from the same location, Steven heads off in a northeast direction for 180 meters and Corinne heads off in a northwest direction for 350 meters. How far apart are Steven and Corinne?
 - **A** 292.4 m
 - **B** 330.5 m
 - **C** 381.5 m
 - **D** 393.6 m
- **6** The base of a wheelchair ramp is 6 feet away from the door. The height of the ramp is supposed to be $\frac{1}{12}$ the horizontal length of the ramp. If this is the case, what is the length of the ramp?
 - **F** 6 ft
 - **G** 6 ft $\frac{1}{4}$ in.
 - **H** 6 ft 1 in.
 - **J** 6 ft 3 in.

OBJECTIVE 8

8.9(B) The student is expected to use proportional relationships in similar twodimensional figures or similar three-dimensional figures to find missing measurements.

Read each question and choose the best answer.

1 Circle *A* has a radius of 5.2 cm. Circle *B* has a radius of 7.8 cm. $\angle CAD$ and $\angle QPR$ are congruent. If arc *CD* is 6 cm, what is the length of arc *QR* to the nearest tenth of a centimeter?



- **A** 6.0 cm
- **B** 7.5 cm
- **C** 9.0 cm
- **D** 10.5 cm
- **2** A building is 75 meters tall and casts a shadow that is 120 meters long. Julie is 5 feet 6 inches tall. About how long is her shadow?

F	8 ft 10 in.	н	8 ft 6 in.
G	8 ft 8 in.	J	8 ft 4 in.

- 3 To estimate the height of her house, Lidia starts by placing a mirror on the ground to sight the top of the structure. She stands 0.75 meters away from the mirror. Her height is 1.5 meters. The mirror is 4.5 meters away from the base of her house. What is the height of her house?
 - **A** 7.5 m
 - **B** 9.0 m
 - **C** 10.5 m
 - **D** 12.0 m

4 A right triangle has a smaller right triangle inside of it as shown in the diagram below. What are the lengths of *x*, *y*, and *z*?



5 A square tile has an area of 144 square centimeters. The tiles are used to cover the floor of a room that is 36 square meters. How many tiles are needed to fill the room?

Α	2500	С	4900
В	3600	D	6400

6 The Burnett Plaza and D.R. Horton Tower are 567 feet and 547 feet tall, respectively. If two people are relative in height like the two buildings, what is the height of the taller person if the shorter person is 5 feet 6 inches tall?

F	5 ft 6 in.	Η	5 ft 10 in.
G	5 ft 8 in.	J	6 ft 0 in.

OBJECTIVE 8

8.10(A) The student is expected to describe the resulting effects on perimeter and area when dimensions of a shape are changed proportionally.

Read each question and choose the best answer.

- **1** The scale factor of two similar polygons is 4:7. The perimeter of the smaller polygon is 320 centimeters. What is the perimeter of the larger polygon?
 - **A** 180 cm
 - **B** 250 cm
 - **C** 390 cm
 - **D** 560 cm
- **2** If the dimensions of a rectangle with a perimeter of 44 inches are doubled, what will be the perimeter in inches of the larger rectangle?
 - **F** 88 in.
 - **G** 132 in.
 - **H** 144 in.
 - **J** 176 in.
- **3** The area of a triangle is 48 square centimeters. What will be the area of the triangle if the dimensions are tripled?
 - **A** 144 cm²
 - **B** 216 cm^2
 - **C** 432 cm^2
 - **D** 864 cm²

- **4** A subdivision consists of a plot of land that is 1200 feet long and 240 feet wide. There are 2 rows of houses, built on smaller plots of land that back up to each other. What is the perimeter of 1 house plot if the land is divided equally for building 60 houses?
 - **F** 260 ft
 - **G** 280 ft
 - **H** 300 ft
 - **J** 320 ft
- **5** The scale factor of two similar polygons is 9:5. The perimeter of the larger polygon is 180 centimeters. What is the perimeter of the smaller polygon?
 - **A** 80 cm
 - **B** 100 cm
 - **C** 120 cm
 - **D** 140 cm
- **6** Sarah has a square swatch of carpet that is 6 inches by 6 inches. She wants to put in new carpet for her living room that is 12 feet by 14 feet. How many swatches would she need to fill the space?
 - **F** 336
 - **G** 672
 - **H** 1008
 - **J** 1344

TAKS Practice

OBJECTIVE 8

8.10(B) The student is expected to describe the resulting effect on volume when dimensions of a solid are changed proportionally.

Read each question and choose the best answer.

1 A box is shaped like a rectangular prism and has a volume of 360 cubic centimeters.

The box is dilated by a scale factor of $\frac{3}{4}$.

What is the volume of the resulting box?

- **A** 151.875 cm^3
- **B** 175.25 cm^3
- **C** 225.25 cm^3
- **D** 270 cm^3

2 A crate measures 5 feet by 5 feet by 8 feet. It can hold 1600 cube shaped boxes. What are the side measurements of each box?

- **F** 0.25 ft
- **G** 0.40 ft
- **H** 0.50 ft
- **J** 1 ft
- **3** A balloon has a radius of 8 centimeters when filled with air. What is the resulting volume of the balloon when the radius of the balloon is tripled?
 - **A** 6434.0 cm^3
 - **B** 12,868.0 cm³
 - **C** 25,735.9 cm³
 - **D** 57,905.8 cm³

4 The Aquarium at Moody Gardens is 128 feet tall with a rectangular base of 220 feet wide and 322 feet long. What would be the volume of an aquarium if a smaller

aquarium was built with each dimension $\frac{1}{8}$

the size of the larger aquarium?

- F 17,710 ft³
 G 141,680 ft³
 H 1,133,440 ft³
- **J** 9,067,520 ft³
- **5** A model of a new facility is built on a scale of 1:15. If the volume of the model is 75 cubic feet, what is the volume of the facility?
 - **A** 16,875 ft³
 - **B** 253,125 ft³
 - C 1,150,325 ft³
 D 3,796,875 ft³
- **6** If the dimensions of a rectangular box with volume of 128 cubic centimeters are tripled, what will be the volume of the new box?
 - **F** 1152 cm³
 - **G** 3456 cm³
 - **H** 10,368 cm³
 - **J** 31,104 cm³

OBJECTIVE 9

8.3(B) The student is expected to estimate and find solutions to application problems involving percents and other proportional relationships such as similarity and rates.

Read each question and choose the best answer.

- Teresa works at a furniture store where she earns \$9.50 per hour plus a 7% commission on weekly sales. If she works for 35 hours this week and sells \$22,000 worth of merchandise, how much will she earn?
 - **A** \$1872.50
 - **B** \$1724.00
 - **C** \$1650.50
 - **D** \$1540.00
- **2** There are 25 students in a class where 20% of the students wear blue jeans. Of the remaining students, 35% wear black jeans. How many students wear black jeans?
 - **F** 4
 - **G** 5
 - **H** 6
 - **J** 7
- **3** Alissa can type at a rate of 45 words per minute. She has to write a 20-page essay where there is an average of 250 words per page. About how long should it take to type the entire essay?
 - **A** 82 min
 - **B** 98 min
 - **C** 104 min
 - **D** 111 min

- 4 Arturo works on a house putting up the frame. He can hammer 8 nails per minute at top speed. If he works with 3 other people who work at the same speed, how many nails can they hammer in 3 hours?
 - **F** 5760
 - **G** 4320
 - **H** 3840
 - **J** 1440
- **5** A baseball card is purchased for \$11 in 1998. It increases by 6% of its purchase price every year. How much will the card be worth in 2006?
 - **A** \$16.23
 - **B** \$17.53
 - **C** \$18.93
 - **D** \$20.45
- **6** David buys a new car for \$28,000. The car depreciates in value by 8% per year. After 5 years he sells the car and invests the money into an account that earns 6% interest compounded annually. What will the investment be worth in 5 years?
 - **F** \$26,843.47
 - **G** \$24,695.99
 - **H** \$22,720.31
 - **J** \$21,237.03

OBJECTIVE 9

8.11(A) The student is expected to find the probabilities of dependent and independent events.

Date

Read each question and choose the best answer.

- **1** There are 8 apples in a bag. Half of them are red and half of them are green. What is the probability of choosing 2 red apples in a row?
 - **A** $\frac{9}{14}$ **B** $\frac{5}{14}$ **C** $\frac{3}{14}$ **D** $\frac{1}{8}$
- **2** Ivan places 3 black balls, 3 red balls, 3 green balls, and 3 blue balls in a drum. What is the probability of pulling a black ball and then a green ball?



- **3** When rolling two 12-sided number cubes, what is the probability that both numbers would be less than 4?
 - **A** $\frac{1}{4}$ **B** $\frac{1}{16}$
 - 16 • 1
 - **C** $\frac{1}{24}$
 - **D** $\frac{5}{144}$

4 Jenna looks into her closet to decide what to wear to school today. She has 4 pairs of jeans, 5 variously colored tops, and 3 pairs of sneakers. Each set of clothing has an equal chance of being chosen. What is the probability that Jenna will wear her black jeans with her blue top and pink sneakers?

F
$$\frac{1}{15}$$

G $\frac{1}{20}$
H $\frac{1}{30}$
J $\frac{1}{60}$

- **5** Terry has 4 bills in his pocket: \$1, \$5, \$10, and \$20. What is the probability that he will pull out 2 bills that sum to more than \$20?
 - **A** $\frac{1}{2}$ **B** $\frac{1}{3}$ **C** $\frac{1}{4}$ **D** $\frac{1}{6}$
- **6** Amy flips a coin and rolls a number cube. What is the probability of tossing heads and rolling an even number?

F $\frac{1}{6}$ **G** $\frac{1}{4}$ **H** $\frac{1}{2}$ **J** $\frac{3}{4}$

OBJECTIVE 9

8.11(B) The student is expected to use theoretical probabilities and experimental results to make predictions and decisions.

Read each question and choose the best answer.

1 A number cube is rolled several times and results are recorded in the table below.

Number	Frequency
1	3
2	5
3	1
4	9
5	14
6	3

What is the experimental probability of rolling a 4?

A $\frac{1}{5}$ **B** 25.7% **C** 0.3 **D** $\frac{2}{5}$

2 Three coins are flipped many times and the results are recorded in the table below.

No. of Heads	Frequency
3	••••
2	• • • • • • • • • • • • • • • • • • •
1	• • • • • • • • • • • •
0	• • •

What is the difference between the theoretical probability and experimental probability of getting 2 heads?

- **F** 11.4%
- **G** 13.8%
- **H** 15.6%
- **J** 16.7%

3 A random number generator is used to create a series of random numbers from 0 to 9. The results are recorded in the table below.

Number	Frequency
0	2
1	5
2	4
3	2
4	8
5	11
6	0
7	4
8	6
9	2

What is the experimental probability of getting an even number on the random number generator?

- **A** $\frac{23}{44}$
- **B** $\frac{1}{2}$
- 2
- **C** $\frac{21}{44}$
- **D** $\frac{5}{11}$
- **4** Phil and Rick play a game of Rock-Paper-Scissors. What is the theoretical probability that they both pick Rock in 2 successive draws?
 - **F** $\frac{1}{243}$
 - **G** $\frac{1}{21}$
 - 81 1

H
$$\frac{1}{27}$$

$$J \frac{1}{9}$$
OBJECTIVE 9

8.12(A) The student is expected to select the appropriate measure of central tendency or range to describe a set of data and justify the choice for a particular situation.

Read each question and choose the best answer.

- **1** Ron scored 15, 19, 24, 19, and 28 points in his last 5 basketball games. If he scores 22 points in his next game, which measure of central tendency will give him the highest result?
 - A mean
 - **B** median
 - **C** mode
 - **D** range
- **2** Sonya tracks customers at a pizza place to determine the most popular type chosen. She records the results in the table below.

Pizza Type	Frequency
Cheese	15
Pepperoni	18
Vegetable	8
Meat Lovers	5

Which measure of central tendency will provide the most meaningful result?

- **F** mean
- **G** median
- **H** mode
- J range
- **3** Lee achieves the following grades on his math tests: 75, 78, 82, 83, and 86. If he scores 85 on his next test, which measure of central tendency will NOT provide a meaningful result?
 - A mean
 - **B** median
 - **C** mode
 - **D** range

- **4** Which measure of central tendency should be used to determine the brand name of track suit that a sporting goods store should carry?
 - **F** mean
 - $\boldsymbol{\mathsf{G}} \hspace{0.1in} \text{median}$
 - \mathbf{H} mode
 - J range
- **5** Anthony tracked the number of hours he worked over the last 5 weeks in the table below.

Week	Hours Worked
1	38
2	40
3	35
4	38
5	40

Which measure of central tendency would change if he worked 37 hours the next week?

- A mean
- **B** median
- **C** mode
- **D** range
- **6** A waiter records the following dinner tabs at his table: \$25, \$40, \$45, \$30, \$20, \$85, \$48, \$112, \$33, and \$52. Which measure of central tendency provides the largest result?
 - **F** mean
 - $\boldsymbol{\mathsf{G}} \hspace{0.1in} \text{median}$
 - **H** mode
 - J range

OBJECTIVE 9

8.12(C) The student is expected to select and use an appropriate representation for presenting and displaying relationships among collected data, including line plots, line graphs, stem and leaf plots, circle graphs, bar graphs, box and whisker plots, histograms, and Venn diagrams, with and without the use of technology.

Read each question and choose the best answer.

- **1** Which of the following could you use to display data about favorite insects collected from all of your classmates?
 - **A** box and whisker plot
 - **B** circle graph
 - **C** line graph
 - **D** stem and leaf plot
- **2** Darren recorded the weights of his fellow classmates and recorded the information he collected in the table below.

Weight Ranges	Frequency
Below 100 lb	2
101–120 lb	5
121–140 lb	14
141–160 lb	18
161–180 lb	6
Above 180 lb	3

Which is the best way to represent these data?

- **F** bar graph
- **G** histogram
- **H** stem and leaf plot
- J Venn diagram

- **3** In a school of 500 students, 220 have no pets, 74 only have a dog, 95 only have a cat, 36 only have a bird, 21 only have fish, 42 have 2 or more types of pets, and 12 have other types of pets. Talia plans to make a circle graph of this data. To the nearest degree, what is the correct measure of the central angle for the sector that represents students with no pets?
 - **A** 44°
 - **B** 79°
 - **C** 158°
 - **D** 220°
- **4** The table summarizes Lauren's weekly donations to her favorite charity.

Week	1	2	3	4	5	6
Amount Donated (\$)	40	50	70	60	40	20

Which of the following is an appropriate scale for the vertical axis of a line graph representing these data?

- **F** 0 to 1000
- **G** 0 to 100
- **H** 0 to 50
- **J** 0 to 6

TAKS Practice

OBJECTIVE 9

8.13(B) The student is expected to recognize misuses of graphical or numerical information and evaluate predictions and conclusions based on data analysis.

Read each question and choose the best answer.

1 The following table lists the total population and population density of 6 U.S. states.

State	Population (2000)	Population Density (per sq mi)
Alaska	648,818	1.1
Texas	20,851,820	79.6
California	33,871,648	217.2
Montana	902,195	6.2
New Mexico	1,819,046	15.0
Arizona	5,130,632	45.2

Which of the following statements is supported by the information in the table?

- A California has more than 18 times the population and more than 14 times the population density of New Mexico.
- **B** The size of a state's population has no bearing on its population density.
- **C** The population of Montana is 3 times the population of Alaska and 6 times its population density.
- **D** The ratio of Texas' population to Arizona's population is equal to the ratio of population density.

2 The circle graph shown below illustrates the types of cars driven by college students.



Which statement would be an invalid conclusion for these data?

- **F** About as many students drive 2-door cars as those who drive vans.
- **G** About twice as many students drive other types of cars in comparison to sports cars.
- **H** There are slightly more station wagon drivers than 4-door drivers.
- **J** SUVs are the second most popular type of car.

OBJECTIVE 10

8.14(A) The student is expected to identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics.

Read each question and choose the best answer.

- 1 Sandi is building a storage shed to store her garden tools. Wood costs \$3.99 per square foot plus 8.25% sales tax. The shed will be built in an area that covers 5 feet by 8 feet. What other information is required to determine how much wood Sandi needs?
 - **A** the type of wood required
 - **B** the tools needed to build the shed
 - **C** the height of the walls for the shed
 - **D** the cost of delivering the wood
- 2 Travis sells custom chairs at a local furniture store. He can make up to 5 chairs per week, which he sells for \$380 each. It costs him \$40 in materials to build each chair. What equation can he use to determine *E*, the amount he earns when making chairs over a period of *x* weeks?
 - **F** $E \le 1700x$
 - **G** $E \le 380x 40$
 - **H** $E \le 380(x 40)$
 - **J** $E \le x(380 40) + 5x$
- **3** Claudia is planting rose bushes along the border of her backyard. She wants to plant them 4 feet apart. How can she determine how many rose bushes to purchase?
 - A Find the area of her backyard and divide by 4.
 - **B** Find the area of her backyard and multiply by 4.
 - **C** Find the perimeter of her backyard and multiply by 4.
 - **D** Find the perimeter of her backyard and divide by 4.

4 In trapezoid *WXYZ*, the length of \overline{WX} is 25 units and the length of \overline{YZ} is 45 units.



What additional data provides sufficient information to find the height of trapezoid *WXYZ*?

- **F** the perimeter of *WXYZ*
- **G** the measure of $\angle Z$
- **H** the length of \overline{WZ}
- **J** the area of *WXYZ*
- 5 Owen can read 3 pages of his favorite book in 5 minutes. What equation can he use to determine *t*, the time in minutes it would take to read *x* pages?

A
$$t = \frac{5x}{3}$$

B $t = \frac{3x}{5}$

C 5t = 3x

- **D** t = 3x 5
- **6** Andre wants to purchase a \$25,000 car. He plans to invest \$10,000 today in an account that earns 7.5%. What equation can he use to determine how long it will take to save enough money?
 - **F** $10,000 = 25,000(1.075)^x$
 - **G** $10,000 = 25,000(1.75)^x$
 - **H** 25,000 = $10,000(1.075)^{x}$
 - **J** $25,000 = 10,000(1.75)^x$

OBJECTIVE 10

8.14(B) The student is expected to use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness.

Date

Read each question and choose the best answer.

- Nicole is planning on joining a yoga class. Club A offers 10 classes for \$150. Club B offers 15 classes for \$250. Club C offers yoga classes for \$18 each, and then gives 2 extra classes for free after taking 13 classes. Which statement is NOT a valid conclusion?
 - A Club A offers the most price competitive option.
 - **B** Club B is a better deal than the Club C.
 - **C** Club B is the most expensive option in the long run.
 - **D** Club C is a better deal than Club B when Nicole takes the 2 free classes.
- 2 The Spanish club is planning a trip to Mexico for a cultural exchange program. The total cost per person is \$285. The club has already raised \$450 for the program and will divide the funds equally between the 12 members of the club. Carlo has saved \$125 so far in order to attend. How much more money does he need in order to take part?

F	\$112.50	н	\$132.50
G	\$122.50	J	\$142.50

- **3** In the system of equations 4x 2y = 18and 5x + 3y = 27, which expression can be correctly substituted for *y* in the equation 5x + 3y = 27?
 - **A** 3 + x
 - **B** 9 + 2x
 - **C** 2x 9
 - **D** 3 x

- 4 Dennis is painting the outside of his house. One gallon of paint costs \$12.50 and covers 350 square feet. He wants to put 2 coats of paint on the walls. The outside of his house measures 2200 square feet. How much will it cost to paint his house?
 - **F** \$81.25 **G** \$157.14
 - **H** \$162.50
 - J \$314.28
- **5** Alex works as a graphic designer making \$16.50 per hour for every hour up to 40 worked in a week. Her overtime on weekdays is computed at 1.5 times her hourly rate, and at 2.5 times the rate on weekends. How much will she earn if she works 52 hours during the week and 7 hours on the weekend?
 - **A** \$973.50
 - **B** \$1130.25
 - **C** \$1205.25
 - **D** \$1245.75
- **6** Gina and 11 other friends rent out a movie theater for 4 hours to have a private party. The theater charges \$80 per hour. The group also spends \$850 in beverages and food for the party. If they agree to split the cost equally, how much will each person have to pay to cover the costs of the party?
 - F \$117
 G \$106.36
 H \$97.50
 J \$90



OBJECTIVE 10

8.14(C) The student is expected to select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem.

Read each question and choose the best answer.

- 1 A rectangle has a perimeter of 38 centimeters and an area of 84 square centimeters. What are the dimensions of the rectangle?
 - **A** 12 cm by 7 cm
 - **B** 11 cm by 8 cm
 - **C** 10 cm by 9 cm
 - **D** 6 cm by 13 cm
- 2 Candace knows that she sells 45 large submarine sandwiches per day at a price of \$9.50 each. For every *y* increase in price, she loses *x* sales. What equation will help her to maximize her revenue?
 - **F** Revenue = (45 + x)(9.5 + y)
 - **G** Revenue = (45 x)(9.5 y)
 - **H** Revenue = (45 x)(9.5 + y)
 - **J** Revenue = (45 + x)(9.5 y)
- **3** If Colin knows the area of a football field, how can he find the area of the surrounding track?
 - A Find the length and width of the combined track and field, and then divide by the area of the field.
 - **B** Find the length and width of the combined field and track, and then subtract the area of the field.
 - **C** Sum the squares of the length and width of track and field, and then find the square root of the sum.
 - **D** Find the length and width of the track, and then the field, sum the totals, and divide by 2.

- **4** The Cole family purchased a boat for \$18,500. A down payment of \$5500 was made and a loan was taken out to pay the rest. The loan agreement states that the Coles will pay back the loan with interest at \$550 per month for 24 months. Which method can be used to find the amount of interest paid on the loan?
 - **F** Subtract \$5500 from \$18,500 and then divide this result by \$550.
 - **G** Subtract \$5500 from \$18,500 and then add this difference to the product of \$550 and 24.
 - **H** Subtract \$5500 from the product of \$550 and 24 and then subtract the \$18,500 from the difference.
 - J Subtract \$5500 from \$18,500 and then subtract that difference from the product of \$550 and 24.
- 5 Cody is putting in new grass for his backyard. Soil costs \$1.99 per square foot. Grass costs \$2.99 per square foot. His backyard is 28 feet by 40 feet. How can Cody determine how much it will cost to do the job?
 - A Multiply the cost of soil by the cost of new grass by the dimensions of his backyard.
 - **B** Add the dimensions of the backyard and then multiply by the sum of the cost of soil and new grass.
 - **C** Add the dimensions of the backyard and then multiply by the product of the cost of soil and new grass.
 - **D** Add the costs of soil and new grass together, and multiply the sum by the total square footage of his backyard.

OBJECTIVE 10

8.15(A) The student is expected to communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models.

Read each question and choose the best answer.

- **1** The value of π is the value of which of the following ratios comparing a circle's circumference to its radius?
 - **A** $\frac{C}{2r}$
 - **B** $\frac{C}{r}$
 - \mathbf{C} Cr
 - **D** 2Cr
- **2** Daniela is starting a home decorating business. She spends \$1100 in supplies, including \$690 for office supplies and other business expenses. The materials she bought for display purposes cost \$2.50 per square yard. Which of the following equations can be used to determine how many square yards of material, *m*, she purchased to start up her home decorating business?
 - **F** 690 + 2.5m = 1100
 - **G** 690 2.5m = 1100
 - **H** 1100 + 2.5m = 690
 - **J** 690m 1100 = 2.5
- **3** Brandon spent \$1225 on video games and a gaming system in the past 6 months. Games cost \$45 each and the system cost him \$505. Which of the following can be used to determine how many games, *g*, Brandon bought?
 - **A** 1225 = 505g 45
 - **B** 1225 = 45g 505
 - **C** 1225 = 505 + 45g
 - **D** 1225 = 505 45g

- 4 Shana wants to calculate the sale of a plot of land adjacent to her house. The current selling price is \$14 per square foot. The land is 50 feet longer than the width and will fetch \$92,400 on the market. What formula can she use to determine the length and width of the property if *x* represents the length in feet?
 - **F** 92,400 = 14x(x + 50)**G** 92,400 = 50x(x + 14)
 - **H** 92,400 = 30x(x + 14)**H** 92,400 = 14x(x - 50)
 - **J** 92,400 = 50x(x 14)
- **5** Brian has to move a number of heavy boxes from a warehouse to his truck. He knows the weight of each box, how much his truck can haul, and how many boxes he can move in a trolley from the warehouse to his truck. How can Brian determine the number of trips required in order to fill his truck?
 - A Divide the hauling capacity of his truck by the weight of one box, and then multiply the result by how much he can carry on his trolley.
 - **B** Multiply the number of boxes he can carry on his trolley by the weight of each box, and then divide by the hauling capacity of his truck.
 - **C** Divide the number of boxes in the warehouse by their total weight, then divide by how many he can carry on his trolley.
 - **D** Divide the hauling capacity of his truck by the weight of one box, and then divide the result by how many boxes he can carry on his trolley in one trip.



TAKS Practice

OBJECTIVE 10

8.16(A) The student is expected to make conjectures from patterns or sets of examples and nonexamples.

Read each question and choose the best answer.

 Benjamin marks off measurements from a ruler onto a piece of paper. The measurements are in twelfths of a foot. They are, arranged in order from least to greatest, 1/12, 1/6, 1/4, 1/3, 5/12, 1/2, 7/12, 2/3, 5/6, 11/12, and 1. Which measurement is missing?



2 The number of cells in a sample is recorded every 8 hours.

Hours	Cells
0	2
8	4
16	8
24	16

How many cells will there be at the end of 7 days?

- **F** 1,048,576
- **G** 2,097,152
- **H** 4,194,304
- **J** 8,388,608

- **3** A light switch is turned on and off according to the formula $L = (-1)^n$, where the light is on when L = 1 and the light is off when L = -1. Based on this formula, when is the light turned off?
 - **A** n = 2
 - **B** *n* = 8
 - **C** *n* = 14
 - **D** *n* = 21
- **4** A man makes two investments whose values are shown in the table below.

Year	Investment 1	Investment 2
0	\$100.00	\$1000.00
1	\$115.00	\$1080.00
2	\$132.25	\$1166.40

If both investments increase at the same rates, how many years will it take for the first investment to surpass the second?

- **F** 34 years
- **G** 35 years
- **H** 36 years
- **J** 37 years
- **5** A sequence produces these results. 2, 5, 8, 11, 14, ...

Which of the following numbers is part of the sequence?

- **A** 45
- **B** 47
- **C** 49
- **D** 51

OBJECTIVE 10

8.16(B) The student is expected to validate his/her conclusions using mathematical properties and relationships.

Read each question and choose the best answer.

- Theo believes that the mode is not an important measure of central tendency. What set of values would show that the mode is a more valuable measure of central tendency than mean or median?
 - **A** 10, 11, 12, 13, 14
 - **B** 10, 12, 12, 12, 14
 - **C** 10, 100, 100, 100, 1000
 - **D** 15, 15, 25, 25, 35, 35
- **2** The population growth and rate of population growth over the last 50 years are shown in the table below.

Decade	Growth (millions)	Percent Change
1950–1960	28.0	18.4
1960–1970	24.0	13.4
1970–1980	23.0	11.4
1980–1990	22.0	9.8
1990–2000	32.7	13.2

Which statement is a valid conclusion based on the data?

- **F** The population growth has decreased steadily over the past 50 years.
- **G** The 1990s have seen the greatest percentage increase in population in the past three decades.
- **H** The population will never grow at the same rate as in the 1960s.
- J Population growth will return to its low levels as seen in the 1980s.

3 Which statement is NOT true about the diagrams seen below?



- **A** All 4 shapes are triangles.
- **B** All 4 shapes have angles that sum to 180° .
- **C** All 4 shapes have congruent angles.
- **D** All 4 shapes are polygons.
- **4** Anita earns 15% for every software package that her clients purchase through her. The company sells the packages for \$2500 each. Which commission total is NOT possible based on how many packages she sells?

F	\$4105	н	\$16,875
G	\$5625	J	\$19,875

5 Consider the following scatterplot.



Which statement is a valid conclusion?

- **A** The value of y decreases from x = 1 to x = 8.
- **B** The value of y reaches its minimum when x is between 5 and 7.
- **C** The value of *y* reaches its maximum at x = 12.
- **D** The value of y is higher when x is less than 6 than when x is greater than 10.

Practice Test

Read each question and choose the correct answer.

- **1** The amount the cafeteria earns, *e*, is given by the formula $e = 5.50\ell + 1.25s + 1.50d$, where ℓ is the number of lunches, *s* is the number of sodas, and *d* is the number of desserts sold. Based on the formula, which statement is true?
 - A The more sodas sold, the less the cafeteria earns.
 - **B** The more lunches the cafeteria sells, the more it earns.
 - **C** The cafeteria earns less when it sells more lunches than desserts.
 - **D** The cafeteria earns more when it sells more sodas than lunches.
- **2** Which statement about these equilateral polygons is true?



- **F** The perimeters of the polygons are equal.
- **G** The areas of the polygons are equal.
- **H** The sides of each polygon are congruent.
- **J** The angles of each polygon are obtuse.
- **3** Selena is filling a planter with potting soil. The planter is shaped like a rectangular prism that is 3 feet long, 8 inches wide, and 8 inches tall. How much potting soil can the planter hold?
 - **A** $1\frac{1}{3}$ ft³ **B** 24 ft³ **D** 192 ft³

4 Miguel has 5 San Antonio Spurs cards and 5 Dallas Mavericks cards. If Miguel randomly chooses 2 of the cards, what is the probability that he will choose 1 card from each team?

F	$\frac{1}{5}$	н	$\frac{1}{2}$
G	$\frac{5}{18}$	J	$\frac{5}{9}$

5 Mary Lou has been working in a new job for 3 weeks. Her pay each week is shown in the table below.

Week	Pay
1	\$125
2	\$175
3	\$225

If Mary Lou's pay continues to increase at the same rate, what will be her pay in week 5?

- **A** \$325
- **B** \$375
- **C** \$400
- **D** \$525
- **6** Which is the parent function of the function graphed below?



Practice Test (continued)

7 The table shown below lists ordered pairs of numbers.

x	-2	-1	0	1	2
У	2	4	6	8	10

Which equation matches the data in the table?

- **A** y = 2x 6 **B** y = 2x + 6 **C** y = 6x - 2**D** y = 6x + 2
- 8 Which expression is equivalent to

 $4(x+4) (x+4) - 3(x^2 - 7x + 12)?$

- **F** $x^2 + 11x + 100$
- **G** $x^2 + 53x + 28$
- **H** $7x^2 + 53x + 28$
- **J** $7x^2 + 84x + 100$
- **9** The graph below shows the speed of an airplane during takeoff. Which statement best describes the graph?



- A The airplane's speed increases about 10 miles per hour every second.
- **B** The airplane's speed increases about 25 miles per hour every second.
- **C** The airplane's speed increases the most in the first few seconds.
- **D** The airplane's speed increases the most in the last few seconds.

10 A clown is shot out of a cannon at the circus. The graph below shows *a*, the clown's altitude in feet, versus *t*, the time in seconds after the cannon is fired.



Based on the graph, which conclusion can be made?

- **F** The clown's altitude was 12 feet 2 seconds after the cannon was fired.
- **G** The clown was in the air for 15 seconds before reaching an altitude of 6 feet.
- **H** The clown's maximum altitude occurred 4 seconds after the cannon was fired.
- **J** The clown was in the air for 10 seconds.
- **11** Which point on the grid satisfies the conditions $x \ge 2$ and y < 6?



- **Α** *L* **Β** *M*
- **C** N

 $\mathbf{D} P$



12 Which inequality best describes the graph shown below?



- $\mathbf{F} \quad y \le 4x + 2$
- **G** $y \ge -4x + 2$
- $\begin{array}{l} \mathbf{H} \quad y \leq -4x + 2 \\ \mathbf{J} \quad y \geq 4x + 2 \end{array}$
- **13** The table below shows Juanita's scores for 5 science tests.

Test No.	1	2	3	4	5
Score	78	82	83	82	85

Which two measures of these 5 scores would NOT change if Juanita had a score of 80, rather than 78, on the first test?

- **A** mean and mode
- **B** mean and range
- **C** median and mode
- **D** mode and range
- **14** Which could be the lengths of the sides of the triangle shown below?



- **F** 9, 12, 15
- **G** 6, 10, 16
- **H** 4, 5, 6
- **J** 1, 2, 3

15 Which could be the missing number in the following number pattern?

1, 1, 2, 3, 5, 8, __, 21 **A** 11 **C** 15 **B** 13 **D** 17

- **16** If $y = x^{-5}$, which expression is equivalent to y^{3} ?
 - **F** x^{-8}
 - **G** x^8
 - **H** x^{15}
 - **J** x^{-15}
- **17** What rate of change is shown in the graph below?





- **C** 0
- **D** 2
- **18** In the figure below, $\triangle ABC$ is similar to $\triangle DEC$. What is the value of *x*?





- **19** What is the equation of the line that passes through the point at (1, 7) and is parallel to the graph of 3x + y = 4?
 - **A** v = 3x + 4
 - **B** y = 3x 4
 - **C** y = -3x 10
 - **D** y = -3x + 10
- **20** A ball is thrown straight up in the air. The height, *h*, of the ball above the ground at t seconds after it is thrown is given by the equation $h(t) = -16t^2 + 80t$. How long after it is thrown does the ball reach its maximum height?
 - **F** 1.5 seconds
 - **G** 2.5 seconds
 - **H** 5 seconds
 - J 8 seconds

21 A triangular prism is shown below.



B 120 in.³

Α

- **C** 132 in.³
- **D** 240 in.³
- **22** Anjolie received a 5.5% raise at her job. If she was earning x dollars a year before the raise, how much is she earning now?
 - **F** x + 5.5
 - **G** x + 0.055

H
$$x + 5.5x$$

J x + 0.055x

23 What is the value of x in the solution to the following system of equations?



24 The following graph shows Mr. Tran's total earnings versus sales.



Based on the graph, which of the following statements is true?

- **F** Mr. Tran earns \$200 when his sales are \$0.
- **G** Mr. Tran earns \$200 when his sales are \$2000.
- **H** Mr. Tran earns \$400 when his sales are \$3000.
- **J** Mr. Tran earns \$600 when his sales are \$7000.



Date

A 10

B 20

25 Which points represent the roots of the function graphed below?



- **▲** (0, −2) and (0, 4)
- **B** (0, -3) and (0, 4)
- **C** (-2, 0) and (1, 0)
- **D** (−2, 0) and (0, −2)
- **26** A water tank is shaped like a cylinder with a radius of 10 feet and a height of 10 feet. Initially, the tank is full of water. Then a valve is opened, and water flows out of the tank at a rate of 50 cubic feet per minute. Which is the best estimate of how long it takes for all the water to flow out of the tank?
 - **F** 63 min
 - **G** 73 min
 - **H** 83 min
 - **J** 93 min
- **27** Ron spent \$169.85 for a CD player and some CDs. He spent \$89.95 on the CD player. The remainder was spent on CDs that cost \$7.99 each. Which equation can be used to determine how many CDs, *c*, Ron bought?
 - **A** 89.95 + 7.99c = \$169.85
 - **B** 89.95 7.99c = \$169.85
 - **C** 89.95c + 7.99 = \$169.85
 - **D** 89.95c 7.99 = \$169.85

28 What are the coordinates of the points that represent the *x*- and *y*-intercepts of the graph shown below?



- **F** (0, 0) and (4, 0)
- **G** (0, -2) and (0, 4)
- **H** (-2, 0) and (0, 4)
- **J** (-5, -6) and (3, 10)
- **29** Which set of ordered pairs describes a function?
 - **A** {(-1, -3), (-2, -3), (3, 6), (3, 7)}
 - **B** {(3, -3), (-3, 3), (-3, 4), (-4, 5)}
 - **C** {(4, -4), (-3, -3), (3, 6), (5, 2)}
 - **D** {(1, 3), (2, 4), (5, 7), (1, 1)}
- **30** A sphere has a volume of 7235 cubic centimeters and a surface area of 1809 square centimeters. What is the radius of the sphere to the nearest centimeter?
 - **F** 20 cm
 - **G** 16 cm
 - **H** 12 cm **J** 9 cm



31 What is the domain of the function shown on the graph below?



- **A** $0 \le y \le 9$
- **B** $-3 \le y \le 3$
- **C** -3 < x < 9
- **D** $-3 \le x \le 3$
- **32** A computer randomly generates two numbers from 1 to 100. What is the probability that both numbers are less than or equal to 20?
 - **F** $\frac{1}{5}$ **G** $\frac{1}{10}$ **H** $\frac{1}{25}$
 - **J** $\frac{1}{50}$
- **33** Which of the following CANNOT be described by a linear function?
 - A the weekly salary of an employee who works at an hourly rate of \$18 for *t* hours
 - **B** the height, *h*, of a ball *t* seconds after it is dropped from the top of a building
 - **C** the property tax on a building if the tax is 3% of the building's total value
 - **D** the distance a car travels in *t* hours at an average rate of 45 miles per hour

34 The net of a box shaped like a triangular prism is shown below. Use the ruler on the Mathematics Chart to measure the dimensions of the box to the nearest tenth of a centimeter.



Which is the best estimate of the total surface area of the box?

- $\mathbf{F} \quad 8 \text{ cm}^2$
- **G** 12 cm^2
- **H** 16 cm^2
- $J \quad 24 \text{ cm}^2$
- **35** Mr. Lopez determined that the total monthly cost, *c*, of running his business could be represented by the equation c = 650e + 2600, where *e* is the number of people he employs. If the total monthly cost of running his business was \$7800 last month, how many people did he employ?
 - **A** 4
 - **B** 8
 - **C** 12
 - **D** 16



Name

Practice Test (continued)

- **36** David earns \$150 less per day than twice the amount Pablo earns. If David earns \$200 per day, which equation can be used to find the amount, *p*, that Pablo earns per day?
 - **F** 2(p-150) = 200
 - **G** 2p 150 = 200
 - **H** 150 2p = 200
 - **J** 2(150 p) = 200
- **37** An airline allows each passenger on a plane to have two bags of luggage, each weighing no more than 50 pounds. If one of the airline's planes weighs 200,000 pounds, which inequality best describes the maximum weight, *w*, of luggage based on *p*, the number of passengers on the plane?
 - **A** $w \le 50p$ **B** $w \le 100p + 200,000$ **C** $w \le 100p$ **D** $w \le 200,000 - 50p$
- **38** Mrs. Zilber bought a car that cost \$22,500. She made a down payment of \$2500 and used a loan to pay the rest. To repay the loan PLUS interest, Mrs. Zilber agrees to make monthly payments of \$450 a month for 48 months. Which method can be used to find the total interest Mrs. Zilber pays?
 - **F** Divide 22,500 by 48.
 - **G** Divide 22,500 by 450.
 - **H** Subtract 2500 from 22,500 and divide the difference by 48.
 - J Subtract 2500 from 22,500 and then subtract that difference from the product of 450 times 48.

39 In a drag race, a dragster accelerates from 0 to more than 300 miles per hour and then slows to a stop. Which graph best describes this situation?





Practice Test (continued)

- **40** The Houston Rocket's basketball court is shaped like a rectangle with a diagonal between 106 feet and 107 feet long. Which could be the dimensions of the court?
 - **F** 94 ft and 40 ft
 - **G** 94 ft and 50 ft
 - **H** 84 ft and 40 ft
 - **J** 84 ft and 50 ft
- **41** Of the 120 contestants in a talent contest, 30% sing a song, 25% play an instrument, and the rest perform a dance. How many of the contestants perform a dance?

Α	27	С	54
В	33	D	63

- **42** Which function has as its solutions (3, 4), (4, 8), and (5, 12)?
 - $\mathbf{F} \quad y = x + 1$
 - **G** y = 2x 2
 - $\mathbf{H} \quad y = 8 x$
 - $J \quad y = 4x 8$
- **43** If the radius of a sphere with a volume of 27 cubic inches is tripled, what will be the volume of the new sphere in cubic inches?

Record your answer and fill in the bubbles in the answer grid below.

0	0	0	0	0	0	0
0	0	0	1	0	1	1
0	0	0	0	0	0	0
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
0	0	0	0	\bigcirc	\bigcirc	0
8	8	8	8	8	8	8
9	9	9	9	9	9	9

44 Which expression can be used to find the values of f(n) in the table below?

n	1	2	3	4	5
f(n)	6	9	12	15	18

A n + 5 **B** 3n**C** 3n + 3

D 6*n*−3





What scale factor was used to transform $\triangle MNP$ to $\triangle RST$?

F

$$\frac{1}{12}$$
 H
 $\frac{1}{2}$

 G
 $\frac{1}{4}$
 J
 $\frac{3}{5}$

- **46** The area of a triangle is $4x^2 + 24x + 20$. The height of the triangle is x + 5. What is the base of the triangle?
 - **A** $2x^2 + 16x$

B
$$2x + 8$$

C
$$4x + 4$$

D
$$4x^2 + 100$$



47 Mr. Gonzalez wants to calculate the cost of a cover for his swimming pool, which has the shape of a rectangular prism. He knows the cost, c, per square foot of cover, and he knows the length, ℓ , width, w, and depth, d, of his pool in feet. Which formula should Mr. Gonzalez use to determine the total cost, t, of a cover?

F
$$t = (\ell \times c) + (w \times c)$$

G $t = \ell \times w$
H $t = (\ell + w) \times c$

- $\mathbf{J} \quad t = \ell \times w \times c$
- **48** In 1980, the population of a town was 48,575. In 1990, the population was 50,200, and in 2000, the population was 51,825. If the population of the town continues to grow at the same rate, what will be the population of the town in 2020?
 - **A** 52,350
 - **B** 52,475
 - **C** 53,450
 - **D** 55,075
- **49** The Star Furniture Company sells stools for \$25 each and chairs for \$35 each. One day, the company sold 75 more chairs than stools and earned \$4125. Which system of equations, could be used to find the number of stools, *s*, and chairs, *c*, the company sold that day?

F
$$25s + 35c = 4125$$

 $c = 75 - s$
G $25s + 35c = 4125$
 $c - 75 = s$

H
$$35s + 25c = 4125$$

 $c = s - 75$

J
$$35s + 25c = 4125$$

 $c = s + 75$

- **50** What is the relation between the graph of $y = -2x^2$ and the graph of $y = 2x^2$?
 - A The graph of $y = 2x^2$ is a horizontal translation of the graph of $y = -2x^2$.
 - **B** The graph of $y = 2x^2$ is a vertical translation of the graph of $y = -2x^2$.
 - **C** The graph of $y = 2x^2$ is a reflection of $y = -2x^2$ across the *x*-axis.
 - **D** The graph of $y = 2x^2$ is a reflection of $y = -2x^2$ across the *y*-axis.
- **51** The table below shows the population and the number of births in 5 Texas cities for the year 2001.

City	2001 Population	2001 Births
Houston	4,293,993	92,647
Dallas	3,654,327	80,409
San Antonio	1,622,921	33,057
Austin	1,319,189	27,077
El Paso	687,543	17,539

Which statement best describes the relationship between the population and number of births?

- **F** In El Paso, the population was more than 45 times the number of births.
- **G** The greater a city's population, the greater the number of births in that city.
- **H** None of the cities had a population more than 45 times the number of births.
- **J** In none of the cities was the population less than 40 times the number of births in that city.



- **52** What is the relation between the graph of $y = 3x^2$ and the graph of $y = 3x^2 3$?
 - **A** The graph of $y = 3x^2 3$ is below the graph of $y = 3x^2$.
 - **B** The graph of $y = 3x^2 3$ is above the graph of $y = 3x^2$.
 - **C** The graph of $y = 3x^2 3$ is narrower than the graph of $y = 3x^2$.
 - **D** The graph of $y = 3x^2 3$ is wider than the graph of $y = 3x^2$.
- **53** The graph of $y = -\frac{5}{2}x + 3$ is shown below.



If the *y*-intercept remains the same and the slope is doubled, what will be the *x*-intercept?

- **F** -5 **H** 5 **G** $-\frac{3}{5}$ **J** $\frac{3}{5}$
- **54** If the base of a parallelogram with an area of 20 square inches is tripled, and the height remains the same, what will be the area of the new parallelogram?
 - **A** 40 in.^2
 - **B** 50 in.²
 - **C** 60 in.^2
 - **D** 100 in.²

55 If triangle *PQR* is reflected across the *x*-axis to become triangle P'Q'R', what will be the coordinates of *R*'?



- **F** (-3, 1) **G** (3, -1) **H** (-3, -1)
- **J** (3, 1)

Date

56 $\triangle RST$ is shown below. What will be the coordinates of point *T*' if the triangle is translated 5 units to the right and 3 units up?



- **A** (5, 9)
- **B** (-3, 1)
- **C** (7, 1)
- **D** (7, 7)





Countdown to TAKS _____

Monday	Tuesday			
1 Which inequality is graphed below? A $y = 3x$ B $y < 3x$ C $y > 3x$ D $y \le 3x$	 2 Nineteen is what percent of 90.5, rounded to the nearest whole number? F 19 G 20 H 21 J 22 			
Wednesday	Thursday			
 3 Darrin tags cows with a red or green tag on his family's farm in Columbus. By noon, 14 tags remain in the bag. Six are green. What are the chances he will draw a red tag next? A 3/7 B 1/2 C 4/7 D 1 	 4 Jenn shortens a skirt pattern from 18 inches to 12 inches. What is true of the area of the pattern piece? F It is ¹/₃ of the original. G It is ²/₃ of the original. H It is ⁴/₉ of the original. J It has not changed. 			
Friday				

5 See the table below. Which conclusion is NOT valid?

Most Popular Names

RANK	2000s	1980s	1960s	1940s
1	Jacob	Michael	Michael	James
2	Michael	Christopher	David	Robert
3	Joshua	Matthew	John	John

A Some names have been favorites throughout these decades.

 ${\boldsymbol{\mathsf{B}}}$ In most of these decades, male names beginning with "M" have been popular.

- **C** The name "Michael" is the only one to appear 3 or more times.
- **D** The chance that a top 3 male name would begin with "J" in these decades was $\frac{5}{12}$.



Countdown to TAKS _____

Monday	Tuesday
 1 The formula <i>rVA</i> = constant tells the velocity a liquid flows through the open end of a pipe. If <i>r</i> is the density, <i>V</i> is the velocity, and <i>A</i> is the area of the open end of the pipe, which statement is true? A The velocity is always constant. B <i>V</i> is dependent only on the constant. C <i>V</i> is dependent only on <i>A</i>. D <i>V</i> is inversely dependent on <i>A</i> and <i>r</i>. 	 2 What is the volume of the largest cylinder that will fit inside a cubical box that measures 1 foot on each side? F 0.605 ft³ G 0.785 ft³ H 1.05 ft³ J 3.14 ft³
Wednesday	Thursday
 3 Some Texas residents run scuba diving schools in former underground missile silos. The silos are shaped like cylinders. If one silo measures 18 meters wide and holds 7,600 cubic meters of water, what is the water's depth to the nearest whole number? A 7 m B 29 m C 30 m D 299 m 	4 If the coordinates of a quadratic equation's solutions are $\left(-\frac{4}{3}, 0\right)$ and $\left(\frac{4}{3}, 0\right)$, what are its roots? F $x = -\frac{4}{3}, \frac{4}{3}$ G $x = 0, 0$ H $y = -\frac{4}{3}, \frac{4}{3}$ J $y = 0, 0$
Frie	day
 5 The Caddo Indians tell a story about twin so twin traveled 3 days east from the village to founded Natchitoches, Louisiana. The other west toward the setting sun. He founded Natchito for the following is NOT a step i village? A Assume that the twins traveled at about B Determine the length of days during the C Calculate the distance between Natchito D Divide by 2 the calculated distance between Nacogdoches. 	ons of an old chief. One oward the rising sun. He t twin traveled 3 days acogdoches, Texas' oldest in locating the old chief's the same speed. season they traveled. ches and Nacogdoches. yeen Natchitoches and



Countdown to TAKS _____

Monday	Tuesday		
 1 Roland orders pizza for himself and his friends. Cheese pizzas cost \$7.99 and pepperoni pizzas cost \$9.99. Which inequality best represents the number of cheese pizzas, <i>c</i>, and pepperoni pizzas, <i>p</i>, Roland can buy for \$30? A \$7.99<i>c</i> - \$9.99<i>p</i> < \$30 B \$7.99<i>c</i> + \$9.99<i>p</i> > \$30 C \$7.99<i>c</i> - \$9.99<i>p</i> ≤ \$30 D \$7.99<i>c</i> + \$9.99<i>p</i> ≤ \$30 	2 Which equation is shown on the graph? F $y = x - 4$ G $y = x + 4$ H $y = 4x$ J $y = -4x$		
Wednesday	Thursday		
 3 If the solutions of a quadratic equation are x = 4 and x = -4, what are the coordinates of its roots? A (2, -2) B (0, 4) and (0, -4) C (2, 0) and (-2, 0) D (4, 0) and (-4, 0) 	4 What is the slope of the line y + 2x = 3? F -2 G -1 H 1 J 2		
Frie	day		
5 A Corpus Christi merchant found that sales were related to seasons when tourists were most likely to visit the city. The relationship of sales to seasons is shown on the graph. Which statement is NOT true? $ \int_{\overline{g}} \int_{$			
 A Sales to tourists are highest in the summer months. B March would be the best time to close the shop for a vacation. C Tourists appear to visit more during the winter break. D Sales to tourists pick up during spring break for schools. 			

Countdown to TAKS

Monday	Tuesday
 1 Which of the following situations can be represented as a linear equation? A A young child gains one clothing size each year. B Nell's hourly wage is \$5.50 in Year 1, \$6.50 in Year 2, \$8.50 in Year 3, \$11.50 in Year 4, and so on. C Each month Carter spends the remaining half of his leftover birthday money. D Company X's profits doubled in Month 1, tripled in Month 2, and quadrupled in Month 3. 	 2 Before a hurricane hit Port Arthur, Neal secured a tree against damage. The tree is 8 feet tall. Halfway up the tree he attached a rope to each side of the tree, and staked both ends to the ground at a distance equal to ¹/₄ the tree's height. About how much rope did he use? F 4.5 ft G 6 ft H 9 ft J 12.00 ft
Wednesday	Thursday
3 What are the intercepts of the graphed line? A (-3, 0), (0, 2) B (-2, 1), (1, 3) C (0, -3), (2, 0) D (0, 0), (-3, 2)	 4 A triangle has a perimeter of 43 centimeters. If the length of all sides is doubled, what is the new perimeter? F 21.5 cm G 43 cm H 86 cm J 258 cm
Frie	day
5 Which coordinates represent the solution to equations below?	the system of
y = 2	2x + 1 2x + 4
A $\left(\frac{1}{2}, -2\right)$ B $\left(\frac{4}{3}, \frac{11}{3}\right)$ C $\left(\frac{3}{4}, \frac{5}{2}\right)$ D $\left(\frac{3}{2}, 4\right)$	





Countdown to TAKS

Monday	Tuesday			
 1 The total cost, <i>c</i>, for making a new product is estimated to satisfy the inequality \$500n + \$500 < c < \$550n + \$1000, where <i>n</i> is the number of products produced. If <i>n</i> is 10, which of the following is a reasonable estimate of the total cost? A \$1000 B \$5000 C \$6000 D \$7000 	2 Use the graph below to solve for x when y is -2. F $x = 1, -1$ G $x = 2, -2$ H $x = 3, -3$ J $x = 4, -4$			
Wednesday	Thursday			
 3 How do the graphs of y = 3x + 3 and y = -3x + 3 differ? A There is no difference. B They have different <i>y</i>-intercepts. C They have different <i>x</i>-intercepts, and the slope of one is the opposite of the slope of the other. D They only have <i>x</i>-intercepts. 	4 Before his camping trip at Lake Sommerville, Mark buys packages of batteries and cans of food. The battery packages are on sale for 10% off their usual \$7 cost. The cans of food are 4 for \$2. Which inequality best represents how many battery packages, <i>b</i> , and cans, <i>f</i> , he can buy for \$25? F \$7.00 <i>b</i> + \$2 <i>f</i> ≤ \$25 G \$7.00 <i>b</i> - \$0.70 + \$2 <i>f</i> ≤ \$25 H \$6.30 <i>b</i> + \$2 <i>f</i> ≤ \$25 J \$6.30 <i>b</i> + \$0.50 <i>f</i> ≤ \$25			
Friday				

5 Michael chooses any 10 consecutive numbers out of the Fibonacci series 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987, 1597, etc. He multiplies the fourth number from the last by 11, and produces the sum of the 10 numbers he chose. Which statement is true?

- **A** The sum of the 10 numbers beginning with 2 is 11(21).
- **B** The sum of the 10 numbers beginning with 5 is 11(144).
- **C** The sum of the 10 numbers beginning with 13 is 11(233).
- **D** The sum of the 10 numbers beginning with 21 is 11(610).

Countdown to TAKS

Monday	Tuesday	
 1 Two rectangular prisms have similar measurements. The first has a volume of 12 cubic inches and a base of 2 inches by 4 inches. The second has a volume of 96 cubic inches and a height of 3 inches. Which could be the measurements of the second prism's base? A 4 in. by 6 in. B 4 in. by 8 in. C 6 in. by 12 in. D 12 in. by 14 in. 	 2 By the end of the year, Tory will turn in a total of 10 projects and papers in history class. She will write 2 fewer than 3 times more papers than projects. What system of equations could be used to solve for the number of papers, <i>p</i>, and projects, <i>t</i>, Tory will complete? F 3<i>p</i> + <i>t</i> = 10 and <i>p</i> = <i>t</i> - 2 G <i>p</i> + <i>t</i> = 10 and <i>p</i> = <i>t</i> - 2 H <i>p</i> + <i>t</i> = 10 and <i>p</i> = 3<i>t</i> J <i>p</i> + <i>t</i> = 10 and <i>p</i> = 3<i>t</i> - 2 	
Wednesday	Thursday	
3 Which system of equations represents the graph? A $y = x^2 - 1$ $y = -x^2 + 1$ B $y = x^2 - 1$ $y = -x^2 - 1$ C $y = x^2 - 2$ $y = -x^2 + 2$ D $y = 2x^2 - 1$ $y = -2x^2 + 1$	 4 What is the effect on the graph of the equation y = x² + 4 when the equation is changed to -y = x² + 4? F The roots of the parabola are changed. G The graph is reflected across the <i>y</i>-axis. H The graph is reflected across the <i>x</i>-axis. J The graph is translated 4 units to the left. 	
Frie	day	
5 Barbara's Dutch relatives helped settle Nederland. She makes snickerdoodles for the city's Heritage Festival. The table shows how many snickerdoodles, <i>s</i> , she makes in relationship to <i>a</i> , the number of attendees. Which expression represents <i>s</i> in terms of <i>a</i> ?		
A 0.015 <i>a</i> C 1.5 <i>a</i>	S	
B $0.15a$ D $\frac{a}{0.15}$ $\frac{500}{600}$ $\frac{700}{10,00}$	0 750 0 900 0 1050 0 1500	





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Countdown to TAKS

Monday	Tuesday		
 Which statement defines the difference between a right circular cylinder and a right prism? A right prism has lateral sides perpendicular to its base. B The height of a prism is measured from one base to its parallel base. C Prisms have polygons as their bases. D Right cylinders have two parallel bases. 	 2 An estimated 260,000 people are in Galveston during Kappa Beach Party. Some are residents, <i>r</i>, and the rest are visitors, <i>v</i>. There are 20,000 more than 3 times the number of visitors as residents. Which is the number of residents? F 45,000 G 60,000 H 65,000 J 66,667 		
Wednesday	Thursday		
 3 A school district produces a scatter plot. It shows how the percentage of students owning cars is related to household incomes near each high school. Which statement is NOT reasonable? A The plot will show the location of each student's home. B The information could help to plan parking lots around new high schools. C Many school districts won't have enough high schools for an effective plot. D Surveying schools in many districts would create a better scatter plot. 	 4 The slope of a line changes from ¹/₂ to ³/₂. Which of the following is true? F The <i>y</i>-intercept always changes for any line with that change in slope. G The <i>x</i>-intercept never changes for any line with that change in slope. H For every run of a unit in <i>x</i>, the line rises 3 times the original rise. J The line is not as steep. 		
Friday			

5 The table shows information about the sound waves produced by guitar strings. Which column relates the wavelength to the length of the strings?

A the first column	Harmonics	Waves	Nodes	Wavelengths
B the second columnC the third column	1	$\frac{1}{2}$	2	2ℓ
D the fourth column	2	1	3	l
	3	<u>3</u> 2	4	$\frac{2}{3}\ell$
	4	2	5	$\frac{1}{2}\ell$



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Countdown to TAKS

Monday	Tuesday	
 1 A pet groomer bathes a group of 33 animals divided between cats and dogs. Twelve are cats. She sees 2 times the number of large dogs as small dogs. How many large dogs does she groom? A 7 B 12 C 14 D 21 	 2 Marcia donates canned goods to one of Houston's homeless shelters. The past 5 months, she donated, in order, 22 cans, 21 cans, 13 cans, 25 cans, and 14 cans. What does the number 19 represent? F the range G the mode H the median J the mean 	
Wednesday	Thursday	
 3 A yacht on Lake Conroe flies a sail that forms a right triangle. The base measures 15 feet and the luff, the part that forms the hypotenuse, is 25 feet. What is the sail's height? A 10 ft B 15 ft C 20 ft D 25 ft 	4 The slope of a line is $\frac{5}{9}$, and the y-intercept is 6. Which is the correct equation? F $y = \frac{5}{9}x + 6$ G $y = 5x + 6$ H $9y = 5x$ J $5y = 9x + 6$	
Friday		
 5 After Jared and his 4 friends entered the Alamo's wooden doors, Jared counted how many tourists entered as a function of time. The graph shows his results. Which statement is NOT reasonable? A "Seconds" has no negative values because Jared did not begin his count before arriving. B "Visitors" includes no negative numbers because Jared did not count visitors leaving. C The line intersected the vertical axis at (0, 5) because Jared started his count 5 seconds after he and his 4 friends entered. D Jared started his count with 5 visitors because he included himself and his 4 friends. 		

Countdown to TAKS 9 Weeks to TAKS

Monday	Tuesday		
 1 A circus daredevil cannonballs out of a cannon's mouth 20 feet off the ground. He reaches a height of 75 feet before dropping 4 seconds later into his safety net 20 feet off the ground. What value is most likely included in the range? A -4 B 0 C 9 D 50 	 2 What happens to the slope of a line if the intercepts change from (-3, 0) and (0, 2) to (3, 0) and (0, 2)? F The slope changes from negative to positive. G The slope does not change. H The slope changes from positive to negative. J The slope is positive for both lines, but climbs more sharply for the first line. 		
Wednesday	Thursday		
 3 Kara sketches Plano's Bicentennial Bur Oak Tree and includes the tree's shadow. What would be a reasonable first step Kara could take to find the tree's height? A Measure the length of her own shadow. B Compare the length of the tree's shadow to that of another tree of unknown height. C Measure the tree's circumference. D Count the tree's rings in a core sample. 	 4 Rectangle <i>PQRS</i> is shown. If the rectangle is dilated by a scale factor of 2, with the origin as its center of dilation, find the new coordinates of <i>R'</i>. F (3, 2.5) G (3, 5) H (12, 10) J (36, 25) 		
Frie	dav		
 5 Shaina has \$43 for school supplies. She buys pencils, <i>p</i>, notebooks, <i>n</i>, and folders, <i>f</i>. Pencils cost \$0.99, notebooks cost \$3.99, and folders cost \$1.99. Which inequality best represents this situation? A \$0.99<i>p</i> + \$3.99<i>n</i> + \$1.99<i>f</i> > \$43 B \$0.99<i>p</i> + \$3.99<i>n</i> + \$1.99<i>f</i> ≤ \$43 C \$0.99 + \$3.99 + \$1.99 ≤ \$43(<i>p</i> + <i>n</i> + <i>f</i>) D (\$0.99<i>p</i>)(\$3.99<i>n</i>)(\$1.99<i>f</i>) < \$43 			
Countdown to TAKS 8 Weeks to TAKS

Monday	Tuesday
1 Ardan builds a ramp for a disabled neighbor in Galveston, where many homes sit on piers. For wheelchair access, ramps have a maximum rise of 1 inch for each 12 inches of run, and a maximum run, <i>x</i> . The neighbor's door is height <i>h</i> from the ground. What inequality tells Ardan if the height <i>h</i> will allow him to build a ramp that meets the guidelines? A $h \ge \frac{x}{12}$ B $h \ge 12x$ C $h \le \frac{x}{12}$ D $h \le 12x$	 2 The graph of quadrilateral <i>MNPQ</i> is shown. What will be the coordinates of Q' if the quadrilateral is reflected across the <i>x</i>-axis? F (-2, -3) G (-2, 3) H (2, -3) J (2, 3)
Wednesday	Thursday
 3 A line's slope decreases by half. What must happen to the graph of the line? A The <i>y</i>-intercept changes. B The line translates to the right 0.5 units. C The line translates to the left 0.5 units. D The line rises or falls only half as much for each unit of run. 	 4 Jess wants to paint diagonal stripes on her wall. She starts in the middle, as shown, and works her way out. What is the approximate length of the first diagonal? F 14.2 ft G 15.6 ft H 16.2 ft J 18.3 ft
Frie	day
 5 Four students work together to complete 9 p Student A completes parts 1, 6, and 8. Studet Student C completes parts 3 and 4. Student and 9. If this data is represented by a circle measure of the central angle for the student A 40° B 33° C 11° D 2° 	parts of a chemistry project. ent B completes part 2. D completes parts 5, 7, graph, which could be the B sector?

Countdown to TAKS 7 Weeks to TAKS

Monday	Tuesday			
 1 In what way does the graph of y = -2x² differ from that of y = -2x² - 1? A y = -2x² is translated one unit above that of y = -2x² - 1. B y = -2x² is translated one unit below that of y = -2x² - 1. C y = -2x² is reflected across the x-axis from that of y = -2x² - 1. D y = -2x² is reflected across the y-axis from that of y = -2x² - 1. 	 2 As manager of a boutique in Grapevine, Nancy makes 1% commission on the first \$2000 in sales, 3% on the next \$1000 in sales, and 5% on any sales beyond that. If the store's sales totaled \$6577 in March, how much commission did Nancy make? F \$65.77 G \$197.31 H \$228.85 J \$328.85 			
Wednesday	Thursday			
 3 Aerodynamic drag on a race car can be modeled by the function: d = kv², where k is a constant that depends on the size and shape of the race car and v is the velocity (speed) of the race car. Which of the following is NOT true? A Drag is zero when velocity is zero. B Drag increases at an increasing rate. C If velocity is doubled then the drag is doubled. D The graph of d versus v is parabolic. 	Thursday4 The table displays the total points, p , that Nguyen's golden retriever has earned in dog shows. Which function describes p as a function of n , the months in which he has competed? $\boxed{\frac{Month, p}{n}}{\frac{1}{3}}$ $\frac{2}{6}$ $\frac{3}{3}$ $\frac{12}{4}$ F 3^n G $3 \cdot 2^{(n-1)}$ H $3 \cdot 2^{(n+1)}$ L $2(n-1)$			
Friday				
 5 The population p_n of squirrels after a number n of years can be predicted by the formula p_n = p₀(2.5)ⁿ, where p₀ is the original population. Which statement is true? A After 2 years, p₂ is 5 times larger than p₀. B After 3 years, a population of squirrels will have gained about 15.625 new squirrels. C The number of squirrels after n years is dependent only on n. D The number of squirrels after n years is dependent on both n and p₀. 				

Countdown to TAKS 6 Weeks to TAKS

Monday	Tuesday			
1 Which equation is graphed below? A $y = \frac{4}{3}x + 4$ B $y = \frac{4}{3}x - 4$ C $y = \frac{3}{4}x - 4$ D $y = \frac{3}{4}x + 4$	2 Nate walks 14 dogs after school. Neighbor A has 3. Neighbor B has 2 more than 3 times as many as Neighbor C. Which system of equations could be used to find out how many dogs each owns if b is the number Neighbor B owns and c is the number Neighbor C owns? F $b + c = 14$ and $b = 3c + 2$ G $b + c = 11$ and $b = 3c + 2$ H $b + c - 3 = 14$ and $b = 3c + 2$ J $3 + b + c = 14$ and $b = c + 2$			
Wednesday	Thursday			
 3 Which set of coordinates represents a linear function? A (-1, -1), (0, 0), (1, 1), and (2, 8) B (-1, 2), (0, 3), (1, 4), and (2, 11) C (-1, 3), (0, 2), (1, 3), and (2, 6) D (-2, 2), (0, 3), (2, 4), and (4, 5) 	 4 What is the surface area (including both sides) of a 3-foot by 5-foot Texas flag? F 7.5 ft² G 8 ft² H 15 ft² J 30 ft² 			
Frie	day			
 5 Nicole is a flyer on her cheerleading squad. graph shows the relationship of the height smight fly with respect to time. Which of the conclusions is true? A If Nicole will be caught by team member the same approximate height as those will tossed her, she will be in the air no more than 0.7 to 0.8 seconds. B If Nicole will land on the ground, she care expect to be in the air about 10 seconds. C Nicole reaches a maximum height betwee 0.4 and 0.6 seconds after being tossed. D Nicole was tossed almost 0.5 seconds be she first reached the height of 7 feet. 	The here $Nicole's Flight$ rs of u			



Countdown	to TAKS
4 Weeks to TAKS	

Monday	Tuesday			
 1 Vita makes wooden bowls and sells them at craft fairs. Her revenue is related to their price, <i>p</i>, by the equation R = -50p² + 600p. What is the effect on her revenue if she reduces the price from \$10 to \$6? A <i>R</i> increases by \$800. B <i>R</i> decreases by \$800. C <i>R</i> increases by \$5600. D <i>R</i> decreases by \$5600. 	 2 Paxton earns \$7.50 an hour at his job at a bike shop. He bought a bike seat for \$45, with an additional sales tax of 5%. Both will be taken out of his paycheck. How much will Paxton bring home on payday in terms of the hours, <i>h</i>, that he works? F \$7.50<i>h</i> - \$45 G 0.05(\$7.50<i>h</i> - \$45) H \$7.50<i>h</i> - 0.05(\$45) J \$7.50<i>h</i> - \$47.25 			
Wednesday	Thursday			
 3 If a cube's side measures 2z³, which expression represents the cube's surface area? A √2z^{1.5} B 24z⁵ C 24z⁶ D 144z⁶ 	 4 Sherri jogs 18 meters in 4 seconds, 27 meters in 6 seconds, and 40.5 meters in 9 seconds. If she continues to jog at this rate, what is the approximate distance she'll jog in 20 seconds? A 70 m C 90 m B 80 m D 100 m 			
Fri	dav			

5 On the Clear Fork of the Brazos Bridge, cables curve down from towers on either side. Meanwhile, suspender cables suspend the roadbed from the curved cables. The graph shows the length of the suspender cables as a function of the distance from the bridge's center. Which statement is NOT true?



- **A** The curve's shape is parabolic.
- **B** A suspender cable at 20 ft from center has the same length as one at -20 ft.
- **C** If one tower was moved further from the bridge's center, the lowest point of the curve would not change.
- **D** If both towers were taller by an equal height, the curved cable would be translated higher.

Countdown to TAKS 3 Weeks to TAKS

Monday	Tuesday			
 1 How is the graph of y = -3x² - 2 different from the graph of y = 3x² + 2? A The graph of y = -3x² - 2 is translated 4 units below the graph of 3x² + 2. B The graph of y = -3x² - 2 is translated 4 units above the graph of 3x² + 2. C The graph of y = -3x² - 2 is reflected across the <i>x</i>-axis from that of 3x² + 2. D The graph of y = -3x² - 2 is reflected across the <i>y</i>-axis from that of 3x² + 2. 	 2 A charity collects money. The equation representing its collection is y = \$2500x + \$500, with x being the number of days money has been collected. If the slope is changed to \$3500, how much will the charity collect? F a total of \$500 G a total of \$2500 H a total of \$3500 J \$3500 per day 			
Wednesday	Thursday			
 3 If the height (in feet) of a toy rocket is given by the formula: h(t) = 128t - 16t², where t is the time in seconds after launch, how long will it take for the rocket to return to the earth? A 16.0 sec B 8.0 sec C 4.0 sec D 0.0 sec 	4 Tyler will strengthen the underside of a 4-foot by 4-foot tabletop with an X- shaped brace. The X will cross in the middle of the table. He marks off a grid to form x- and y-axes, with the origin at one corner of the table. Which system of equa- tions could be used to describe the X and find the center of the table? F $y = -2x + 4$ and $y = x - 4$ G $y = -x + 4$ and $y = x - 4$ H $y = -x - 4$ and $y = x - 4$ J $y = -x + 4$ and $y = x$			
Friday				
5 You need to decide which of the following long distance plans best meets your needs:				
1) \$2 per month plus 10¢ per minute, or				

2) \$10 per month plus 5¢ per minute, or

3) \$20 per month for unlimited calls.

Which of the following steps would most likely NOT be part of an approach to solving this problem?

- **A** Write equations (or inequalities) and solve them.
- **B** Construct a table of cost versus minutes.
- **C** Construct a graph of cost versus minutes.
- **D** Construct a circle graph.

Name	Date
Countdown to TAKS 2 Weeks to TAKS	
1 $\triangle RST$ is shown. If it is dilated by a scale factor of 2 and has the origin as the center of dilation, which are the coordinates of <i>S</i> '? A (16, -16) B (4, -4) C (0, 8) D (-8, -8) D (-8, -8)	 2 Which of the following could NOT be represented by a linear function? F Dave deposits 2% of his steady paycheck each month. G Each week, Jon adds two coins to his collection. H Mary cashes a savings bond, and for the next five days, spends ¹/₅ of the money. J Company Y sells half its remaining inventory of bolts each day.
Wednesday	Thursday
 3 If √w² + 4z⁶ is the length of the hypotenuse of a right triangle and w is the length of one side, what is the length of third side? A 4z⁶ B 2z³ C √2z³ D √w² + 4z⁶ - w 	 4 Wildfires burned across Northeast Texas in January 2006. If an equation predicts the number of fires as a function of atmospheric temperature, which value would NOT likely be within the domain for this relationship? F 45° F G 56° F H 57° F J 95° F
Frie	day

- **5** Tammi deposits \$300 into a special account. If she leaves the money in the account for 2 years, the relationship of the future value, FV, of the account to the interest rate, r, is a quadratic one. If the relationship is graphed with FV being the vertical axis and r the horizontal axis, what would the original \$300 deposit represent?
 - **A** the root of the equation
 - ${\boldsymbol{\mathsf{B}}}$ the solution of the equation
 - **C** the *x*-intercept
 - **D** the *y*-intercept

Countdown to TAKS

Monday	Tuesday			
 1 The school play requires two actors to fly across the 30-foot-wide stage. They start at stage right (x = 0) at the same time. Actor A's path can be described as y = -x + 20 feet, and Actor B's path can be described as y = -2x + 30 feet. If they travel at the same speed, what will happen? A They will collide. B The lines intersect, but Actor A will cross the point of intersection before Actor B. C The lines are parallel, so they will not collide. D The lines intersect, but Actor B will cross the point of intersection before Actor A. 	Tuesday 2 Marissa gathers 26 flowers. She collects 1 less than 2 times the number of bluebonnets as paintbrushes. Which system of equations could be used to find the number collected of paintbrushes, <i>p</i> , and bluebonnets, <i>b</i> ? F $b + p = 2b$ 2b - 1 = 26 G $b + p = 26$ p = 2b - 1 H $b + p = 26$ b = 2p - 1 J $2b + p = 26$ p = b - 1			
Wednesday	Thursday			
 3 A portion of the polygon <i>PQRST</i> is shown. Which coordinates will complete a convex pentagon? A (2, 2) B (1, 0) C (0, 2) D (0, 1) 	 4 For the years 1995 through 1999, Chappell Hill's Bluebonnet Festival had attendance records of 6500, 6000, 5500, 6000, and 6750, respectively. If 1996 had an attendance of 5500 instead of 6000, which of the following would change? F the mean G the mode H the mode and mean J the range and the mean 			
Friday				
5 For each number <i>n</i> in a series, $\frac{f(n-1)}{f(n)} = 0.618$. Which statement below is true? A Multiplying the 10th number by a factor of 0.618 will produce the 11th number. B Multiplying the 10th number by a factor of 0.618 will produce the 9th number. C Dividing the 10th number by a factor of 0.618 will produce the 9th number. D Dividing the 9th number by a factor of 0.618 will produce the 8th number.				

Benchmark Test 1

Read each question and choose the best answer.

1 The graph below shows how much resale value Adam's new car loses over a period of several years.



What can Adam reasonably conclude about the car's loss in value?

- A Value decreased at an even rate each year.
- **B** Value decreased more slowly in early years than in later ones.
- **C** Value decreased more quickly in early years than in later ones.
- **D** Halfway through the period shown on the graph, value stabilized.
- 2 Sanjay's and Kim's parents each bought them the same music DVD, but they both preferred other artists. Sanjay exchanged his DVD for three other CDs and received \$3 in change. Kim exchanged his DVD for two CDs and received \$6 in change. If the CDs all cost the same amount, *c*, and the original DVD their parents each purchased cost *d*, which system of equations could be used to determine the cost of the original DVD?

F

$$d = 3c + 6$$
 H
 $d = 2c + 6$
 $d = 2c + 3$
 $d = 3c + 3$

 G
 $d = 3c - 6$
 J
 $d = 2c - 6$
 $d = 2c - 3$
 J
 $d = 3c - 6$

- **3** A balloon is slowly dropping straight down. Its height is described by function h = -1.5t + 270 feet, where *h* is the distance above the ground, in feet, and *t* is the time, in seconds. At the moment the balloon begins dropping, another balloon is directly below it. The second balloon's height from that moment is described by h = -0.5t + 150 feet. Which statement is true of these balloons?
 - **A** They collide after 42 seconds.
 - **B** They collide at 90 feet.
 - **C** The first balloon hits the ground before the two balloons can collide.
 - **D** The second balloon hits the ground before the two balloons can collide.
- **4** A parallelogram is shown below.



If A is the area of the parallelogram, which expression gives the value of h?

F

$$\frac{A}{12}$$
 H
 $6A$

 G
 $\frac{A}{6}$
 J
 $12A$

5 The Johnsons' backyard has an area of 400 square feet. They plan on knocking down their back fence and extending the yard. The length of the yard will double, and the width will remain the same. What will be the change in the

backyard's area?

- **A** It will be four times the original area.
- **B** It will double.
- **C** It will remain the same.
- **D** It will be half the original area.

- **6** Janie is practicing archery. She has hit the 50-point center circle 3 times, the wider 30-point circle 4 times, and the wider 10-point circle 3 times. Based on these results, what is the probability that her next shot will hit the 50-point center circle?
 - F
 3% H
 $\frac{3}{7}$

 G
 50% J
 0.30
- **7** Sulma hit a golf ball at the SugarTree Golf Course in Dennis. The table displays the relationship between the time elapsed after Sulma hit the ball, and the ball's height.

Time Elapsed (sec)	Height of Ball (ft)
0	0
3	25
4	35
6	35
7	25
10	0

If the ball's height is a quadratic function of time, between what times did the ball reach a height of 32 feet?

- A between 0 and 3, and 7 and 10 seconds
- **B** between 3 and 4 seconds, and between 6 and 7 seconds
- **C** between 4 and 6 seconds
- **D** between 7 and 10 seconds
- 8 Merchants advertise the size of their TVs by giving the length of a diagonal across the screen. If a merchant advertises a 34-inch screen and the height of the screen measures 22 inches, what is the width of the screen, rounded to the nearest inch?

F	12 in.	н	891 in. 2
G	26 in.	J	1640 in. 2

9 What function is graphed below?



10 Corinne learned that the number of petals on a flower is often one of the series of numbers 1, 2, 3, 5, *k*, 13, 21, 34, 55, 89, and so on. This is true of the one-petal calla lily, the 21-petal Shasta daisy, and Texas' state flower, the bluebonnet. The bloodroot flower has *k* petals, the missing number in the series. Which of the following is *k*?

F 7 **G** 8 **H** 9 **J** 11

11 The triangles below are similar.



Which of the following could be the dimensions of the triangle on the right?

- A height 134 units, width 54 units
- **B** height 134 units, width 27 units
- **C** height 67 units, width 54 units
- **D** height 201 units, width 54 units



12 Which statement best explains what will happen to the slope of the line graphed below if its *y*-intercept remains the same, but the line is pivoted so that the *x*-intercept moves from 2 to -2?



- **F** The new line will be perpendicular to the one shown on the graph.
- **G** The slope will double.
- **H** If the slope of the original line was *m*, the slope of the new line will be $\frac{m}{2}$.
- **J** If the slope of the original line was m, the slope of the new line will be -m.
- **13** What will happen to the slope of a line if the *y*-intercept decreases and the *x*-intercept stays the same?
 - **A** The slope will increase.
 - **B** The slope will decrease.
 - **C** The slope will stay the same.
 - **D** There is not enough information to answer the question.
- **14** Carla received a \$25 gift card to her favorite restaurant, where sodas cost \$1.50 and desserts cost \$3. Which inequality represents how many sodas, *s*, and desserts, *d*, Carla can buy with her gift card?
 - **F** 1.5s + 3d > 25
 - **G** $1.5s + 3d \le 25$
 - $\mathbf{H} \quad 1.5d + 3s \le 25$
 - $J \quad 1.5s 3d \le 25$

15 Ashley's grandmother bought 100 shares of stock for \$33 a share. She expects to make a 10% profit which she will give to Ashley. How much can Ashley expect to receive?

Record your answer by filling in the bubbles on the answer grid below.

0	0	0	0	0	0	0
0	0	1	1	0	1	0
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
$\overline{0}$	\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc
8	8	8	8	8	8	8
9	9	9	9	9	9	9

16 What are the *x*- and *y*-intercepts of the graph below?



- **F** (0, 3.3) and (0, 2) **H** (3.3, 0) and (2, 0) **G** (3.3, 0) and (0, 2) **J** (3.3, 2) and (0, 0)
- **17** Chase is playing a board game with his brother. Each of two number cubes is numbered 1 through 6, and he needs to roll a six on each to win. What is the probability that he will roll a six on both number cubes?

A
$$\frac{1}{2}$$
 C $\frac{1}{12}$
B $\frac{1}{3}$ **D** $\frac{1}{36}$



Benchmark Test 1 (continued)

18 Manuel, a track team member, recovers from an injury. His doctor allows him to run 1 mile or less each day. He wants to jog in the rectangular park shown below. What further information could allow Manuel to determine whether one pass around the rectangular path is less than or equal to a mile?



- **F** the lengths of \overline{AB} and \overline{CD}
- **G** the lengths of \overline{AC} and \overline{AB}
- **H** the lengths of \overline{BC} and \overline{AD}
- **J** the measures of $\angle CAB$ and $\angle CAD$
- **19** Which of the following is the equation of the line through (0, 1) and (3, 3)?
 - **A** $y = \frac{1}{3}x + 2$ **B** $y = \frac{2}{3}x + 1$ **C** y = 2x + 3**D** y = 3x + 1
- **20** Celia's scores for her last five gymnastics competitions can be found in the table.

October 30	8.4
November 6	9.5
November 20	8.9
November 27	9.2
December 4	8.9

Which of these measures would change if Celia's coach contested her November 27 score and it was raised to 9.4?

F	mean	н	mode
0	1.		

G median **J** range

- **21** The function y = 3x 3 has a range of $\{0, 3, 6\}$. What is its domain?
 - **A** {−9, 12, 21}
 - **B** {−9, 6, 15}
 - **C** {−1, 0, 1}
 - **D** {1, 2, 3}
- **22** The net of a cone is shown below. What is the surface area of the cone?



- **G** π in.²
- **H** 1.25π in.²
- **J** 1.50π in.²

23 Which expression is equivalent to $36x^{-6}y^2z^{-2}$

$$6x^{6}y^{-2}$$

B
$$\frac{6}{x^{-12}y^4z^{-4}}$$

$$C \quad \frac{6x^{12}z^4}{y^4}$$

D
$$\frac{6y^4}{x^{12}z^4}$$



Name

Benchmark Test 1 (continued)

- **24** Stacy's room is a square measuring 10 feet by 10 feet. Which of the following lengths of rope would reach diagonally from one corner to the other while leaving the least amount of leftover rope?
 - **F** 11 ft
 - **G** 12.5 ft
 - **H** 15 ft
 - **J** 20 ft
- **25** What is the value of y if (2, y) is a solution to the equation -2x + 2y = 4?
 - **A** 0
 - **B** 1
 - **C** 4
 - **D** 6
- **26** Square *ABCD* is shown below.



If ABCD is reflected across the *y*-axis, what will be the coordinates of D'?

- **F** (−3, −3)
- **G** (−2, −3)
- **H** (−1, 3)
- **J** (3, 3)

27 About how much cord is needed to hang a clothes line between the two trees shown below, rounding to the nearest whole integer?



- **A** 8 ft **B** 9 ft
- **C** 11 ft
- **D** 18 ft
- **28** In 2002, the Dallas Cowboys moved their training camp indoors, to the Alamodome in San Antonio. They rented 230,000 square feet of an artificial turf system to train on. What is the minimal amount of information needed to determine how much the Cowboys paid for the rental?
 - **F** the cost per week for each square foot of rented turf
 - **G** the length and width of the Alamodome's playing field
 - **H** the length of the Alamodome's playing field and the cost per square foot of the rented turf
 - J the length of the Alamodome's playing field and the cost per week of the rented turf



- **29** Which of the following tables represents a situation when *y* is NOT a linear function of *x*?
 - x
 -4
 -2
 0
 1
 5

 y
 -8
 -6
 -4
 -3
 1
 - B x 0 -1 1 -3 3 y 0 1 1 9 9
 - C x -5 -3 2 4 5 y 2 0 -5 -7 -8

D	x	-3	-2	-1	0	1
	у	-28	-19	-10	-1	8

30 What is *m*, the slope of the line shown in the graph?

x



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31 What is the slope of the line



- **32** Gene stacked 1-inch cubes to form a pyramid-shaped structure. He used 30 blocks. The base measured 4 inches on each side. Which of the following is height of the pyramid?
 - **F** 2 in.
 - **G** 3 in.
 - **H** 4 in.
 - **J** 5 in.
- **33** The sophomore class raises funds by selling pumpkin spice cupcakes packed in decorated boxes. The empty boxes weigh 280 grams. Each cupcake weighs not more than 80 grams. Which inequality best represents the total weight in grams, *w*, of the filled box in terms of *c*, the number of cupcakes in the box?
 - **F** $w \le 80c + 280$ **G** w < 80c - 280
 - **H** $w \ge 80c 280$ **H** $w \ge 80c + 280$
 - **J** $w \ge 80c 280$



34 Alma began her own business selling homemade candles over the Internet. All candles have bases of the same size. The table below shows the relationship between the amount of wax required for each candle and its height.

Candle Height (in inches)	Wax Required (oz)
4	32
5.5	44
6	48
10	80

If she decides to add a candle 9 inches high to her product list, how much wax will she need to order for each 9-inch candle?

- **F** 51 oz
- **G** 60 oz
- **H** 72 oz
- **J** 78 oz

35 Cameron's club sells candy to raise funds for a trip. Candy bars are picked up and sold each day. The table below shows the results.

Day	Number of Bars Sold
Thursday	1
Friday	25
Monday	3
Tuesday	9
Wednesday	15
Thursday	3
Friday	30

Which of the following is the best way to represent this data to show the differences in the daily number sold as time passes?

- **A** a bar chart
- **B** a circle graph
- **C** the table above
- **D** a line graph
- **36** Which system of equations is represented by the graph below?



F y = x - 4 and y = 4x + 4 **G** y = x + 4 and y = -4x + 4 **H** $y = \frac{1}{2}x + 2$ and y = 2x + 2**J** y = x + 4 and y = 4x + 4



37 Caitlyn wants to cut down the time she spends on each math problem so she can complete her homework before practicing for cheerleading nationals in Dallas. She times her efforts. The table shows her results, with *n* representing days 1, 2, 3 and 4 of her efforts, and with f(n) being the number of problems completed per minute.

n	1	2	3	4
f(n)	1	5 3	$\frac{7}{3}$	3

Which expression tells Caitlin how many problems per minute she might expect to work on another day, (day n)?

- **A** $\frac{n+1}{3}$ **B** $\frac{n-1}{3}$ **C** $\frac{2n+1}{3}$ **D** $n+\frac{1}{3}$
- **38** Krysten wants to increase registration for her mountain biking club's summer racing series. The graph below shows the participants in each age group.



If the budget only allows Krysten to focus her efforts on a one-year age range, which of the following ranges would be best?

F	ages 12–13	Н	ages 15–16
G	ages 13.5–14.5	J	ages 16.5–17.5

39 The graph shows $\triangle NPQ$.



Which graph shows a dilation of $\triangle NPQ$ by a scale of 0.5 with the origin as the center of dilation?



40 Trevor's dive earned him a winning score at his last competition. The graph represents how his height varied with time in seconds.



From the graph, what can be concluded about Trevor's dive?

- **F** Trevor dove from a platform 10 meters high.
- **G** Trevor reached his maximum height 4 seconds after leaving the platform.
- **H** Trevor reached his maximum height less than 4 seconds after leaving the platform.
- **J** Trevor stayed in the air more than five seconds before hitting the water.
- **41** The volume of a cone is $V = \frac{1}{3}Bh$, where

B represents the area of the cone's base. If both the height of the cone and the radius of the base can vary, which statement is true?

- **A** The volume of the cone is dependent only on the height of the cone.
- **B** The volume of the cone is dependent only on the area of the base.
- **C** The volume of the cone is dependent on the height of the cone and the area of the base.
- **D** The volume of the cone is dependent only on the product of $\frac{1}{3}$ and the height of the cone.

42 Of the 25 students in a classroom, 40% carried their books to class inside their backpacks. Out of the remaining students, 3 carried their books in their arms, and the rest did not bring any books. How many students did not bring any books?

F	7	н	12
G	10	J	15

43 The diagram below shows the top of a house.



Which picture below best represents that same house?



44 What happens to the graph of $y = x^2 + 4$ when the equation is changed to

 $-y = x^2 + 4?$

- **F** The graph is reflected across the x-axis.
- **G** The graph is reflected across the *y*-axis.
- **H** The graph is translated 4 units right.
- **J** The graph is translated 4 units left.



45 Nathan wants to enroll in an AP class, but he's worried about his GPA. His counselor tells him that in last year's class, juniors earned an average grade of *x* and seniors earned an average of *y*. If there were 8 juniors and 11 seniors in last year's class, what is the average grade per student?

A
$$\frac{8x + 11y}{19}$$

B $\frac{8x + 11y}{3}$
C 19(8x + 11y)

- **D** 3(8x + 11y)
- **46** Using the ruler in the Mathematics Chart, measure the dimensions of the rectangle to the nearest quarter inch. If this is the base of a rectangular prism that is 1 inch high, what is the volume of the prism to the nearest tenth?



- **G** 1.7 in³
- **H** 2.2 in^3
- **J** 3.0 in^3
- **47** Jordan wants to write an expression that is always divisible by 9. Which of the following will always produce an integer that is divisible by 9 for any integer, *n*?

A
$$n + 9$$
 C $\frac{n}{9}$

B
$$(n-1) + 9$$
 D $9n$

48 Which inequality is graphed below?



F
$$y \le 4x$$

G $y \le 4x - 2.5$
H $y > 4x - 2.5$

 $\begin{array}{c} y \leq 4x \\ \mathbf{J} \quad y \geq 4x \end{array}$

49 Which expression is equivalent to $4(x^2 - 3x) - (2x - 3)?$ **A** $4x^2 - 14x + 3$

- **B** $4x^2 10x + 3$
- **C** $4x^2 14x 3$
- **D** $4x^2 + 10x + 3$
- **50** Three out of the four polygons pictured below share the same classification. Which polygon does not?



- **F** triangle
- **G** square
- **H** rectangle
- **J** hexagon



- **51** How does the graph of $y = 3x^2 + 2$ differ from the graph of $y = 3x^2$?
 - **A** The graph of $y = 3x^2 + 2$ is wider than the graph of $y = 3x^2$.
 - **B** The graph of $y = 3x^2 + 2$ is shifted up from the graph of $y = 3x^2$.
 - **C** The graph of $y = 3x^2 + 2$ is shifted down from the graph of $y = 3x^2$.
 - **D** The graph of $y = 3x^2 + 2$ is shifted to the right of the graph of $y = 3x^2$.
- **52** Emilio invites friends over to watch a Houston Astros game. To feed them he needs to double a recipe. The recipe includes a shopping list, measurements for ingredients, and a step-by-step procedure for preparing the dish. What are the first and second steps Emilio needs to take in order to prepare the food?
 - **F** Buy the groceries on the shopping list and then follow the first step of the recipe.
 - **G** Buy the groceries on the shopping list and then double the measurements for each ingredient.
 - **H** Double the measurements for each ingredient and then buy the needed ingredients.
 - J Follow the first and second steps in the recipe.
- **53** If $3x^2 4x 4 = 0$, then what are the possible values for *x*?

A
$$x = -\frac{2}{3}, 2$$

B $x = \frac{2}{3}, -2$
C $x = \frac{3}{2}, 2$
D $x = \frac{3}{2}, -2$

54 Jacob's driving instructor has taught him to slow his car to stop at a smooth, even rate. The graph of the car's speed as a function of time is shown below, with a slope of -0.6 for this line.





Which of the following will happen if Jacob brakes at an even rate, starting from the same velocity, but then changing the slope of that line to -0.3?

- **F** He will bring the car to a stop at 5 seconds.
- **G** He will bring the car to a stop at 10 seconds.
- **H** He will bring the car to a stop at 20 seconds.
- J It is not possible to know when he will bring the car to a stop without knowing his original velocity.

55 What are the zeros of the graphed function?



- **B** (0, -3) and (0, 3)
- **C** (0, -9)
- **D** (-9, 0)



- **56** Kelly and her younger sister share a case for CDs. The case holds 18 CDs and is always full. At any given time, Kelly stores between two and five times the number of CDs as her sister. Which of the following best describes *c*, the number of CDs Kelly's sister might have in the case?
 - F
 $3 \le c \le 6$ H
 $12 \le c \le 15$

 G
 $c \ge 12$ J
 $c \ge 6$
- **57** Which of the following can be restated as a linear function?
 - **A** The length of a square's diagonal in terms of the square's area.
 - **B** The amount of oil needed for an outboard motor in terms of *r*, the ratio of oil to gasoline, if the volume of the tank is known.
 - **C** The amount of soil needed to fill a flower pot in terms of the pot's radius, *r*, if its height is known.
 - **D** The volume of pellets needed to fill a cube-shaped packing box in terms of the length of its sides, *s*.
- **58** The graph below displays a portion of parallelogram *PQST*.



Which coordinates for the vertex *S* would complete parallelogram *PQST*?

F	(2, 5)	н	(5, 5)
G	(5, 4)	J	(6, 5)

59 Anya and Derek work as sales clerks after school. Their employer will give a bonus to the one whose sales performance improves the most over a two-month period. The graph below represents their performances. What statement is NOT true?



- **A** In the beginning of the contest, Derek's performance improved more quickly than Anya's.
- **B** Anya's performance improved at the same rate each week.
- **C** Derek's performance declined toward the end of the contest.
- **D** Over the course of the contest, Anya and Derek sold the same amount in hundreds of dollars.
- **60** Jared has a small container shaped like a cube. He uses the small container to fill a larger container that is also a cube. The small cube's edges are 2 centimeters, and the larger cube's edges are 4 centimeters. How many smaller cubes will fill the larger cube?
 - **F** 2
 - **G** 4
 - **H** 6
 - **J** 8



Benchmark Test 2

Read each question and choose the best answer.

 In January 1901, the first oil well blew more than 100 feet high in the Spindletop Oil Field near Beaumont, Texas. The graph shows how the velocity at which oil flows, *V*, is related to the area of the open end of the pipe, *A*.



Area of Open End of Pipe

Which statement is NOT true?

- **A** V changes when A changes.
- **B** V is greater when A is less.
- **C** V is greater when A is greater.
- **D** V is greatest when A is least.
- **2** Adrienne sold bracelets and necklaces. She sold 17 bracelets and 22 necklaces and collected \$26. The necklaces sold for twice the price of the bracelets. Which system of equations could be used to determine the price of the bracelets, *b*, and the price of the necklaces, *n*?
 - **F** 17b + 22n = \$39n = 2b
 - **G** 17b + 22n = \$26n = b + 2
 - **H** 17b + 22n = \$26n = 2b

J
$$17b + 22n = $39$$

 $n = 2b$

- **3** A football coach gave a player instructions to start 1 yard to the right of the quarterback's position and run straight forward. If the quarterback is at the origin, the players path might be described as part of the line x = 1. The coach told another player to stand to the left of the quarterback and angle to the right as he ran forward. His path could be described as part of the line y = 2x + 3. If the two started forward at the same time from the *x*-axis, and ran forward at the same speed, at what point did they collide?
 - A one yard to the right of the quarterback and one yard forward
 - **B** one yard to the right of the quarterback and three yards forward
 - **C** one yard to the right of the quarterback and four yards forward
 - **D** one yard to the right of the quarterback and five yards forward
- 4 When archaeologists discover a pyramid, one archeologist measures one side of the square base, *s*. Another climbs the face and measures its length, *ℓ*. Which mathematical formula could be used to measure the pyramid's height?
 - **F** distance formula
 - **G** Pythagorean Theorem
 - **H** quadratic formula
 - **J** slope of a line
- 5 Carrie has a curtain 4 feet wide and 6 feet long. It is too long to hang in her window. If she cuts two feet off the length of the curtain, how will its area change?
 - **A** The area will double.
 - **B** The area will decrease by half.
 - **C** The area will increase by 8 ft^2 .
 - **D** The area will decrease by 8 ft².



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- **6** In his left pocket Ralph has 4 quarters and 5 nickels. In his right pocket, he has 3 quarters, 2 nickels, and 1 penny. If he wants to select a quarter at random, which pocket should he choose, and why?
 - **F** The left pocket, because it has more quarters.
 - **G** The left pocket, because it has a larger amount of money.
 - **H** The right pocket, because it gives him a better probability of picking a quarter.
 - **J** The right pocket, because it contains fewer coins.
- 7 Connor notices that the arch of the garden gate leading into a city park has a parabolic shape. The shape follows the curve shown in the graph below.



If Connor wanted to design a similar arch for his family's garden, which formula would he use to reproduce the shape of the curve?

A
$$y = -0.2x^2 - 5$$
 C $y = 0.2x^2 + 5$
B $y = -0.2x^2 + 5$ **D** $y = 0.2x^2 - 5$

- **B** $y = -0.2x^2 + 5$ **D** $y = 0.2x^2 5$
- **8** Shaun needs rags to wash and dry his truck. He rips an old towel that measures 3 feet wide by 5 feet long into 4 pieces. Which set of rectangles below could represent the pieces of the towel?



9 If *C* is a constant, which parent function would create the graph shown below?





10 Cells are instructed to develop by information held in their DNA. Each strand of DNA has four subunits, represented by the letters *A*, *C*, *G* and *T*. One common sequence is below.

AAACAACTTCGTAAGTATC

Which rule below is NOT consistent with the sequence above?

- **F** One C is never adjacent to another C.
- **G** Each A is always adjacent to another A.
- **H** Each G is always followed by a T.
- **J** Ts never occur in groups of three.
- **11** Paula makes a mat for a picture frame. The outer edge of the mat measures 8 inches wide by 10 inches long. The dimensions of the inner edge will create a similar rectangle. If the width of the inner edge measures 6.25 inches, how long will the other side be?



- **12** A line is translated so that the *y*-intercept changes from (0, -1) to (0, 3). What happens to the slope?
 - **F** The slope will change from positive to negative.
 - **G** The slope will change from negative to positive.
 - **H** The slope of the line will be 4 times the original slope.
 - **J** The slope will not change.

- **13** What happens to the slope of a line if the *y*-intercept increases and the *x*-intercept stays the same?
 - **A** The slope will increase.
 - **B** The slope will decrease.
 - **C** The slope will stay the same.
 - **D** The answer depends on whether the line intercepts the *x*-axis when x < 0 or x > 0.
- **14** Juan has \$100. He buys shirts for \$12.99 each and pants for \$25.50 each. Which inequality best represents the number of shirts, *s*, and pants, *p*, that Juan can buy for \$100?
 - **F** 12.99p + 25.50s > 100
 - **G** $12.99s + 25.50p \le 100$
 - **H** $12.99p + 25.50s \le 100$
 - **J** $12.99s 25.50p \le 100$
- **15** Josh found a used car for \$7500. He has \$5500 saved, and will finance the remaining amount. He is charged an interest rate of 14% on the amount he financed. How much will he pay in interest?

Record your answer and fill in the bubbles on the answer grid.

	2	8	0			
0	0	0	0	0	0	0
1	1	1	1	1	1	1
0	2	0	0	0	0	0
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
\bigcirc	\bigcirc	0	\bigcirc	\bigcirc	\bigcirc	0
8	8	8	8	8	8	8
9	9	9	9	9	9	9



16 What are the coordinates of the *y*-intercept of the function graphed below?



- **A** (0, 2)
- **B** (2, 0)
- **C** (2, 2)
- **D** There is no *y*-intercept.
- **17** Jamie gives his dog a treat every day when he gets home from school. The bag has 14 dog bones left. Three are green and the rest are brown. What are the chances that he will choose a brown bone?

F $\frac{3}{14}$ **G** $\frac{1}{2}$ **H** $\frac{2}{3}$ **J** $\frac{11}{14}$

- **18** Jared says that doubling the length of a side of a cube, *s*, increases its volume, *V*, by four times. Cathi says *V* would increase by 8 times. How can Cathi demonstrate that she's right without using the formula?
 - A Use blocks to assemble a structure two wide and two deep, then count the total number of blocks.
 - **B** Use blocks to assemble a structure two wide, two deep, and two high, then count the total number of blocks.
 - **C** Use blocks to assemble a structure four wide, four deep, and four high, then count the total number of blocks.
 - **D** Use blocks to assemble a structure eight wide, eight deep, and eight high, then count the total number of blocks.

19 Which of the following describes the line through the points at (0, 3) and (3, 1)?

F
$$y = -3x + 3$$

H $y = \frac{1}{3}x + 3$
G $y = -\frac{2}{3}x + 3$
J $y = 3x + 3$

20 The totals of Cate's last five gasoline bills can be found in the chart below.

October	\$55
November	\$79
December	\$57
January	\$54
February	\$56

Cate's Gasoline Bills

Which of these measures would NOT have changed if Cate's gasoline bill had been \$58 in November, instead of \$79?

Α	mean	С	mode
В	median	D	range

- **21** A diver's path from the platform all the way to the bottom of the pool can be expressed as a quadratic equation. If *h* is height of the diving platform above the water and *x* is the distance traveled from the platform, which of these statements about the domain and range is true?
 - **F** The domain includes only those values from 0 to the *x*-intercept.
 - **G** The range CANNOT include negative values.
 - **H** The domain includes values greater than the x-intercept.
 - **J** The range CANNOT include values lower than the height of the platform.



22 The net of a pyramid is shown below. Using the ruler on the Mathematics Chart, find the dimensions of the pyramid to the nearest centimeter. What is the surface area of the pyramid?



23 If the volume of a cube is $z^{-9}k^{18}$, what is *s*, the length of a side?

F	7-27k54	н	$z^{-9}k^{18}$
	2κ		6
G	$\sqrt{z^{-9}k^{18}}$	J	$z^{-3}k^{6}$

24 If the ramp below forms a right triangle with the ground and the moving van, how high is the ramp off the ground where it meets the truck?



25 Which inequality is graphed below?



26 Find the coordinates of S' if quadrilateral *PQRS* is translated 4 units to the left.



27 An ant walks along two edges of a square picnic table. Each side of the table is four feet long. If the ant had walked along a diagonal instead, how far would it have walked?





Benchmark Test 2 (continued)

- **28** Cassidy wants to record her own CD. The sound studio charges \$2000 for the studio and the musicians. Her grandfather has agreed to loan her the money if she repays him in 6 months. Cassidy thinks she can sell 45 CDs a month. How would Cassidy calculate what she should charge for her CDs to repay her grandfather on time?
 - **A** Divide \$2000 by 6.
 - **B** Divide \$2000 by 45.
 - **C** Multiply 45 by 6 and subtract the product from \$2000.
 - **D** Divide \$2000 by the product of 45 and 6.

²⁹ Which is of the following tables represents *y* as a linear function of *x*?

_						
F	X	1	2	3	4	5
	у	0	-1	-2	-3	-4
G	X	-4	-2	0	2	4
	у	16	4	0	4	16
Н	x	-2	-1	0	1	2
	у	-11	-4	-3	-2	5
J	x	-2	-1	0	1	2
	у	6	3	2	3	6

30 What is the slope of the line that contains the points at (0, 2), (2, 3) and (4, 4)?



31 What is the slope of the line

$$5x = 9y - 3?$$

F $-\frac{5}{9}$
H $\frac{5}{3}$
G $\frac{5}{9}$
J $\frac{9}{5}$

32 Marco works at an ice cream shop. One of the cones has a volume of 1.62 cubic inches. The diameter of the cone is 1.5 inches. What is the height of the cone?

Α	0.31 in.	С	1.54 in.
B	1.08 in.	D	2.75 in.

33 Armando works after school for a corporation with offices overlooking San Antonio's River Walk. Heavy-duty shredders have arrived for each office on the 20th floor. The elevator has a weight limit, *w*, in pounds. Armando weighs 180 pounds and the shredders each weigh 50 pounds. Which inequality can Armando use to calculate how many of the shredders, *s*, he can bring on the elevator at one time?

F
$$s \ge \frac{w - 180}{50}$$
 H $s \ge 50w - 900$
G $s \le \frac{w + 180}{50}$ **J** $s \le \frac{w - 180}{50}$

34 Four cylindrical pitchers have the same heights, but different-sized bases. The smallest has a volume of 63.6 cubic inches and a diameter of 3 inches. The largest pitcher has a diameter of 6 inches. What is the volume of the largest pitcher, rounded to the nearest inch?

Α	66 in. ³	С	169 in. ³
В	127 in. ³	D	254 in. ³



Name

Benchmark Test 2 (continued)

35 Casey baked cookies for five friends. Matt and Cheryl each ate 10%, Corey and Carla each had 25%, and Sarah had 30%. Which diagram below represents how many cookies each friend had?



36 Solve the system of equations.

0

$$3x + 4y = 12
3x - 4y = 0$$
A $x = 0, y = 0$
B $x = 1\frac{1}{2}, y = 2$
C $x = 2, y = 1\frac{1}{2}$
D $x = 4, y = 3$

37 Casey's grandfather sends her to buy a tension spring for the pasture fence. When Casey pulls the spring through a distance x, the spring pulls back with a force, F. The table gives the relationship of *F* to *x* for the spring.

x (tension)	F (force)
0.5	187.5
1	375
2	750
4	1500

Which equation represents the relationship of F to x?

- **F** F = 375x
- **G** F = -375x
- **H** F = 187.5x**J** F = -187.5x



Date

- **38** A pattern often occurs in stock market prices where prices rise beginning about the last trading day of December, and continue rising through the first trading day in January. Which chart below does NOT show the January effect?
 - Α 584 582 580 Dollars 578 576 574 572 570 X 0 27 28 29 30 3 4 5 6 9 10 11 12 13 Dec Jan В V 584 582 580 **Dollars** 578 574 572 570 0 27 28 29 30 3 5 4 6 9 10 11 12 13 Jan Dec С у 584 582 580 Dollars 578 576 574 572 570 х 0 27 28 29 30 3 4 5 9 10 11 12 13 6 Jan Dec D y 584 582 580 Dollars 578 576 574 572 570 x 0 27 28 29 30 3 4 5 6 9 10 11 12 13

Dec

Jan

39 Doug's parents want to remodel the bathroom with hexagonal tiles. They ask Doug to expand the pattern below.



Use the ruler provided on the Mathematics Chart. Which shows a dilation with a scale factor of 1.5?



40 Galileo found that the stopping distance, s, of an object slowing down at a constant rate, -a, can be described as a quadratic function of V, the velocity of the object. Such a relationship is shown in the graph below.



Which of the following statements is true?

- A If *V* is doubled, the stopping distance doubles.
- **B** If *V* is doubled, the stopping distance is reduced by half.
- **C** If *V* is doubled, the stopping distance is 4 times longer.
- **D** If *V* is doubled, the stopping distance is 8 times longer.
- **41** A function to determine the number of calories burned might be expressed as C = bEt, where *C* is the number of calories, *b* is a constant, *E* is the effort measured in calories per second, and *t* is time. Which statement is NOT true?
 - **F** More effort results in more calories burned.
 - **G** A lower value for *b* results in fewer calories burned.
 - **H** C is a function of b, E and t.
 - **J** *C* is more dependent on the effort applied than on the time spent exercising.

42 Nelson has a package of 30 candies. He gives 30% of the candy to his sister. Out of the remaining candy, 17 pieces are chocolate or vanilla and the rest are strawberry. How many strawberry pieces does Nelson have?

Α	3	С	9
В	4	D	17

43 The diagram below shows an ornament.



Which picture below best represents a cross section of that same ornament?



- **44** What happens to the graph of $y = 3x^2$ if 1 is substituted for 3?
 - **A** The parabola narrows.
 - **B** The parabola widens.
 - **C** The parabola is translated higher by 3 units.
 - **D** The parabola is translated lower by 3 units.



- **45** When Stacey took Geometry, she improved her grade 3% over the grade she made in Algebra I. If her Algebra I grade was *k*, what was her Geometry grade?
 - **F** 1.03k **H** $\frac{k}{1.03}$ **G** 0.97k **J** $\frac{k}{0.97}$
- **46** Using the ruler on the Mathematics Chart, measure the dimensions of the rectangle to the nearest quarter inch. If this rectangle is the base of a rectangular prism that is 2 inches high, what is the volume of the rectangular prism?



47 The amount of coffee beans Mark grinds per cup appears in the table below.

Relationship of Coffee Beans to Cups of Coffee

Beans, Measured in Cups	<u>1</u> 16	$\frac{1}{4}$	<u>1</u> 2	<u>5</u> 8
Cups of Coffee	1	4	8	10

Which expression can be used to determine the amount of coffee beans needed for *n* cups of coffee?



48 Amelia uses a \$50 gift card to download audio books for a neighbor. The cost of each download is \$7.50. Which table best describes *b*, the balance remaining on the gift card after she downloads *n* books?

_		
Α	n	b
	1	50.00
	2	42.50
	3	35.00
	4	27.50

_		
В	n	b
	1	42.50
	2	35.00
	4	20.00
	6	5.00

-		
С	n	b
	0	50.00
	1	50.00
	2	42.50
	3	35.00

n	b
2	35.00
3	27.50
4	20.00
7	1.50

D

49 Find an equivalent expression for



- **50** Cicadas emerge in 13-year or 17-year cycles. One brood, A, swarms in 13-year cycles and will next emerge in 2011. Another brood, B, swarms in 17-year cycles and last emerged in 2004. A third brood, C, swarms every 17 years and will next emerge in 2017. Carlo believes that at some point in the future, all three broods will appear in the same year. Which proves that he is wrong?
 - **A** The years when brood B will next appear can be written as the linear function 2004 + 17n, where *n* is the *n*th next time of their appearance.
 - **B** Broods A and B alone will appear the same year sometime in the future.
 - **C** Broods A and C alone will appear the same year sometime in the future.
 - **D** The linear functions that predict when broods B and C appear have the same slope but different *y*-intercepts, so these two lines will never intersect.
- **51** If the equation $y = \frac{3}{2}x^2 2$ were changed to $y = \frac{3}{2}x^2 - 1$, how would the graph of the equation change?
 - **F** It would shift one unit to the left.
 - **G** It would shift one unit to the right.
 - **H** It would shift one unit up.
 - **J** It would shift one unit down.
- 52 Sammy wants to buy his younger sister a guitar for her birthday next week. The guitar costs \$97.25, including sales tax. Sammy will work 12 hours this week at \$9.80 per hour. His company deducts 5% from his paycheck to pay various taxes. After buying the guitar, how much money will Sammy have left?

Α	\$14.47	С	\$20.35
В	\$19.33	D	\$25.21

53 Solve the equation $5x^2 - 5 = 0$. Which solution is correct?

F
$$x = -5, 1$$

H $x = -\frac{1}{5}, 1$
G $x = -1, 1$
J $x = 5, -1$

54 Fuel bills have been increasing rapidly for Grace's family. The graph below shows how costs have been increasing since Grace has been tracking them.





What does the slope of this graph show about the cost of fuel?

- **A** Each month, the fuel bills rise \$1.
- **B** Each month, the fuel bills rise \$10.
- **C** The slope of the graph is 6.
- **D** Two months after Grace began tracking, the fuel bills had doubled.
- **55** Find the zeros of the quadratic equation graphed below.



F (-1, 0) and (1, 0)
G (0, -4)
H (0, -1) and (0, 1)
J (-4, 0)



is true?

Benchmark Test 2 (continued)

56 Together Kathy and Jimmy have enough money to buy two concert tickets totaling \$27. Jimmy has \$3 more than two times the amount Kathy has. If *y* is the amount of money Jimmy has, and *x* is the amount Kathy has, how much will each person contribute?

Α	(\$8, \$19)	С	(\$19, \$8)
В	(\$15, \$12)	D	(\$20, \$7)

- **57** Which of the following situations can be represented by a linear function?
 - F The population of a colony of bees that increases by 2 times the first year, 4 times the second year, and 16 times the third year.
 - **G** The amount of helium needed to fill a series of balloons as a function of *r*, the radius of the balloons.
 - **H** The number of trading cards Jordan owns if he buys exactly 25 cards each month.
 - J The number of hours it will take for a puddle to dry if half of the remaining puddle evaporates each hour.
- **58** What are the coordinates of the endpoints of a line segment that measures the height of trapezoid *PRST*?



- **A** (-3, -2) and (-1, 3)
- **B** (-3, -2) and (2, 3)
- **C** (-1, -2) and (-1, 3)
- **D** (3, -2) and (2, 3)

59 Morgan received \$400. She wants to save it for her college fund, and invests it in an account. The money increases in value according to the graph below. Which statement about her investment choices

Investment Value



- **F** If Morgan leaves for college at the end of two years, the account will not yet have grown to an amount more than \$500.
- **G** The account will grow in value by more than \$100 a year.
- **H** The account will grow in value by less than \$50 a year.
- J If Morgan lets the investment grow for 4 years, she will have increased her original \$400 investment by more than 50%.
- **60** Sheila's refrigerator holds two rectangular juice cartons. One is 2 inches by 2 inches on each side and 4 inches tall. The other measures 4 inches by 4 inches on each side and is 8 inches tall. What is the difference in volume between the two cartons?
 - **A** 8 in.³
 - **B** 16 in.³
 - **C** 112 in.³
 - **D** 128 in.³



Benchmark Test 3

Read each question and choose the best answer.

1 Ramirez bought a house. The graph below shows the change in value of his house for the first five years of ownership.



Based on the graph, which is not a valid conclusion?

- A The value increased during three of the years and decreased during two of the years.
- **B** After five years the value had increased by more thatn \$10,000.
- **C** After five years the value will continue to decrease.
- **D** The greatest increase in value occurred during year three.
- **2** Harlee helped her sister sell 60 glasses of lemonade and 14 cookies. They made \$44. The cookies sold for twice the cost of a glass of lemonade. Which system of equations could be used to determine the prices of the cookies, *c*, and each glass of lemonade, *g*?

F
$$14c + 60g = $44$$

 $c = 2g$
G $14c + 60g = 44
 $c = g + 2$

H
$$14c + 60g = $44$$

 $g = 2c$

J
$$60c + 14g = $44$$

 $c = 2g$

- **3** Two ladybugs take off at the same time from different points along a tree trunk, flying at the same speed. The first ladybug's flight can be described as y = 2x + 1, and the second as y = -x + 4, where $x \ge 0$ for both equations. If (0, 0) represents the intersection of the tree trunk with the ground, at what point will the ladybugs collide?
 - **A** (0, 4)
 - **B** (1, 3)
 - **C** (3, 7)
 - **D** The ladybugs will not collide.
- **4** Jennifer's family is renting a tent for her sister's quinciera. Portable air conditioners will cool the interior. Each cools 3200 cubic feet. To determine the amount of cubic feet in the tent, which measure will Jennifer calculate?
 - **F** area
 - **G** perimeter
 - **H** surface area
 - J volume
- **5** Martin painted a 3-foot-long strip of a 10-foot-high wall. The wall is 12 feet long. What is the relationship of the area of the painted strip to the area of the whole wall?
 - **A** The painted area is $\frac{1}{2}$ the area of the whole wall.
 - **B** The painted area is $\frac{1}{3}$ the area of the whole wall.
 - **C** The painted area is $\frac{1}{4}$ the area of the whole wall.
 - **D** The painted area is 4 times the area of the whole wall.



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- **6** Lauren has a bag of 36 marbles. Selecting at random, she has so far picked six red and three green marbles. How many red marbles could she predict are in the entire bag?
 - **F** 12
 - **G** 18
 - **H** 24
 - **J** 30
- 7 Which are the solutions of the quadratic equation $13z + 6 = -6z^2$?

A
$$z = -2 \text{ or } -3$$

B $z = -\frac{2}{3} \text{ or } -\frac{3}{2}$
C $z = \frac{2}{3} \text{ or } \frac{3}{2}$
D $z = 2 \text{ or } 3$

8 Kasey fits four smaller boxes inside a larger box. Which box below will hold all four small boxes?



9 Regency's Colorado River Bridge is one of Texas' remaining suspension bridges. What parent function best describes the curve of the labeled suspension cable between the support pillars?



10 When Alma visits historic Fredericksburg, she finds an antique black-and-white quilt. What pieces are needed to repair it?



- **F** three black triangles and three white ones
- **G** two black squares, one black triangle, and one white triangle
- **H** one white square, two black triangles, and two white triangles
- J one black square, two white triangles, and two black triangles



- **11** A set of stacking cups has similar proportions. The red stacking cup has a height of 6.5 centimeters and a diameter of 4.5 centimeters. The blue one has a diameter of 3.2 centimeters. What is the height of the blue stacking cup, rounded to the nearest tenth of a centimeter?
 - A 2.2 cm
 C 6.5 cm

 B 4.6 cm
 D 9.1 cm
- **12** What will happen to the graph of the line y = 2x + 2 if the slope of the line is changed to -2?
 - **F** The graph will remain the same.
 - **G** The *y*-intercept will change.
 - **H** The line will be translated 2 units higher.
 - J The *x*-intercept changes from (-1, 0) to (1, 0).
- **13** What happens to a line when the positive slope, *m*, is changed to -m?
 - **A** The line will not change.
 - **B** The *y*-intercept will change.
 - **C** The line will be translated across the x-axis.
 - **D** The *x*-intercept will change.
- 14 Nadia has \$25 and wants to buy cupcakes and sodas for her class. Cupcakes cost \$0.75 each, and sodas cost \$1.05 each. Which inequality best represents how many cupcakes, *c*, and sodas, *s*, Nadia can buy?
 - **F** \$25c + \$0.75s > \$1.05
 - **G** $1.05c + 0.75s \le 25$
 - **H** $0.75c + 1.05s \le 25$
 - **J** $0.75c 0.75s \le 25$

15 The senior class raised \$4589 for the prom. The class needs 6% more. How much money would this be?

Record your answer and fill in the bubbles on the answer grid below.

0	0	0	0	0	0	0
1	0	1	1	0	1	0
2	0	0	0	0	0	0
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
\bigcirc	0	0	0	0	0	0
8	8	8	8	8	8	8
9	9	9	9	9	9	9

16 What are the coordinates of the *x*- and *y*-intercepts of the graph below?



A (-4, 3)

- **B** (-4, 0) and (0, 3)
- **C** (3, 0) and (0, -4)
- **D** (3, −4)


- **17** Twenty-one pieces remain in a bag of trail mix. There are 11 raisins and 10 peanuts. What is the chance that Katie will pick a peanut for her next bite?
 - $\frac{1}{21}$ F
 - $\frac{10}{21}$
 - Н
 - $\frac{11}{21}$ J
- **18** Todd's teacher placed 100 carpet squares on the floor in a 10-by-10 checkerboard pattern of two colors. The teacher writes the equation y = 2x + 2 on the board. How would Todd find the square that represents *y* when x = 1?
 - **A** Start at the bottom left corner. Step one square to the right and two squares up.
 - **B** Start two squares to the right of the bottom left corner. Step one square to the right and two squares up.
 - **C** Start two squares above the bottom left corner. Step one square to the right and two squares up.
 - **D** Start two squares above the bottom left corner. Step two squares to the right and one square up.
- **19** Which of the following describes the line through the points at (-6, 0) and (0, 2)?

F
$$y = -3x + 3$$

G
$$y = 3x + 3$$

H
$$y = \frac{1}{3}x + 2$$

J
$$y = -\frac{2}{3}x + 3$$

20 The number of points Chris scored in the last five basketball games is shown in the table.

Points	Per	Game

Game 1	23
Game 2	22
Game 3	23
Game 4	14
Game 5	27

Which of these measures would change if in Game 2 Chris had scored 18 points instead of 22, and in Game 3 he had scored 27 points instead of 23?

Α	mean	С	mode
В	median	D	range

21 In the 435-member House of Representatives, each state has at least one member. The number each state has, f(p), depends on the proportion of that state's population of 22,490,022. Based on this information, which statement best describes the range of f(p) for Texas?

F
$$1 \le f(p) \le 749$$

G
$$1 \le f(p) \le 435 - 49$$

H $1 \le f(p)$

$$1 \le f(p)$$

$$\mathbf{J} \quad 1 \le f(p) \le \frac{435}{50}$$



22 The net of a cube is shown below. Using the Mathematics Chart, find its dimensions to the nearest quarter of an inch. What is the volume of the cube?



- **A** 0.0156 in.³
- **B** 0.0625 in.³
- **C** 0.125 in.³
- **D** 0.25 in.³
- **23** If a sphere's volume is $36\pi z^6$, which expression is its radius?
 - $\mathbf{F} z^2$
 - **G** $3z^2$
 - **H** $3z^{3}$
 - **J** $6z^2$
- **24** The park's slide is 6 feet off the ground at its highest point. The distance from the base of the ladder to the end of the slide is 4.5 feet. How long is the slide?



- **C** 7.5 ft
- **D** 8.0 ft

25 Which inequality is graphed below?



26 If triangle *TUV* is reflected across the *v*-axis, which will be the coordinates for V'?



Α	(-2, 2)	С	(0, 2)
В	(-1, -1)	D	(2, -2)

27 Walking home from school, Jason cuts diagonally across a field. The edges of the field measure 10 yards by 10 yards. What is the distance that he walks, rounded to the nearest tenth of a yard?



- **F** 10.0 yd **G** 14.1 yd
- **H** 16.8 yd **J** 20.0 yd



- **28** A family wants to grow baby corn on its Panhandle farm. The extension agent advises ordering one baby corn plant per square foot of farmland. A total of 75,625 corn plants are ordered for a square plot. How many plants will go to waste if the family discovers that a 10-foot strip along one side of the plot is not suitable for growing baby corn?
 - **A** 100
 - **B** 1000
 - **C** 2650
 - **D** 2750
- **29** Which of the following tables represents a situation when *y* is NOT a linear function of *x*?

F	x	1	2	3	4	5
	у	0	-1	-2	-3	-4
G	x	-4	-2	0	2	4
	у	16	4	0	4	16
Η	x	-2	-1	0	1	2
	y	2	4	6	8	10
J	Y	_2	_1	0	1	2

30 What is the slope of the line that contains

3

1

-1

-3

5

- the points at (0, 6), (1, 8), and (2, 10)?
- **A** −2

V

- **B** 2
- **C** 6
- **D** 8

31 What is the slope of the line

4x	= 2y - 3?		
F	$\frac{1}{2}$	Н	2
G	$\frac{2}{3}$	J	4

- **32** Marta sees a cylindrical vase for sale. The label gives its volume as 100.5 cubic inches and its diameter as 4 inches. What is its height to the nearest inch?
 - **A** 2 in. **B** 4 in. **C** 6 in. **D** 8 in.
- **33** Lucia makes corn husk dolls to sell at the local craft fair. Each package of husks contains 120 husks and costs \$4.50. If Lucia can sell each doll for \$3, what is her profit, *P*, in terms of the minimum number of husks, *n*, required to make each doll?

F
$$P \le \$3(\frac{120}{n}) - \$4.50$$

G $P \ge \$3(\frac{120}{n}) - \4.50
H $P \le \$3(\frac{120}{n}) + \4.50
J $P \ge \$3(\frac{n}{120}) - \4.50

34 Two downtown buildings are rectangular prisms. Their bases have the same dimensions, but not their heights. The height of Building 1 is 224 feet, and the building has a volume of 1,260,000 cubic feet. The volume of Building 2 is 1,012,500 cubic feet. What is the height of Building 2?

Α	100 ft	С	180 ft
В	120 ft	D	279 ft



35 Twenty percent of the sophomore class students drive themselves to school. Twenty percent ride the bus. Forty percent carpool with a friend, ten percent walk, and the remaining 10% come by other means. Which diagram below represents how many students use each method for getting to school?



36 Which system of equations is represented by the graph below?



- **A** y = -2x + 2 and y = -3x + 1
- **B** y = 2x 2 and y = 2x + 1
- **C** y = 2x + 1 and y = 3x + 2
- **D** y = 2x + 2 and y = 3x + 1
- **37** Damon set goals to improve his scores on a new video game. The table shows his projected goals for each week.

Damon's Goals

Day (<i>n</i>)	Score (S)
1	250
2	750
3	1250
4	1750

Which function can be used to describe the relationship of *S* to *n*?

- **F** S = 250 + 250(n-1)
- **G** S = 250(2n 1)
- **H** S = 500(n-1)
- **J** S = 250(n-2)



38 The scatter plot shows Texas' population growth from 1999 through 2005. Based on the graph, which statement is a reasonable conclusion?



- **A** Texas' population will double by 2012.
- **B** Texas' population in 2007 may be projected to be about 23,640,000.
- **C** Texas' population is increasing by about 250,000 a year.
- **D** Texas' population will level off slightly above 23,000,000.

39 An antique canister is part of a graduated set.



Which of the other canisters is neither a dilation nor contraction of the first canister?

FLOUR	
FLOUR	
FLOUR	
\sim	
FLOUR	Go on
	FLOUR FLOUR

40 Ken threw a basketball. The solid line graph shows height versus time traveled. Which conclusion is valid?



- A The ball reached its maximum height more than 1.2 second after leaving Ken's hand.
- **B** The ball landed in the basket after being in flight for more than 2 seconds.
- **C** The ball reached its maximum height between 0.8 and 1.2 seconds.
- **D** If the basket had not interfered, the ball would have hit the floor at exactly two seconds into its flight.
- 41 August borrows money from her grandfather to buy an MP3 player. She agrees to pay interest in the amount of *I*. If *I* = *prt*, where *p* is the amount she borrowed, *r* is the interest rate, and *t* is the time it takes to repay the loan, which statement is true?
 - **F** Since *p* and *r* do not change after the loan is arranged, *I* will remain unchanged no matter how long she takes to repay the loan.
 - **G** I is dependent only on r and p.
 - **H** The higher the interest rate, the longer it will take to repay the loan.
 - **J** The longer she takes to repay the loan, the more interest she will pay.

42 Thirty-three articles of clothing hang in Sheila's closet. Thirteen are shirts. Twenty percent of the remaining items are coats. How many coats hang in Sheila's closet?

Α	2	C	10
В	4	D	20

43 See the building diagram below.



Which drawing best represents a view of the base of the building?









- **44** What happens to the graph of $y = 2x^2 + 1$ if the equation is rewritten as $y = 2x^2 - 1$?
 - **A** The parabola widens.
 - **B** The parabola is translated two units to the left.
 - **C** The parabola is translated two units lower.
 - **D** The parabola is reflected across the x-axis.
- **45** Tabitha works for a car rental agency on the weekends. One Saturday she leases 11 vehicles, including a number of SUVs, *S*, and a number of small compact cars, *C*. If she receives a \$20 commission for each SUV she leases and a \$9 commission for each compact car, which expression shows the average commission she earned for all of the vehicles?

$$\mathbf{F} \quad \frac{\$20S + \$9C}{11} \qquad \mathbf{H} \quad \frac{\$20S - \$9C}{11} \\ \mathbf{G} \quad \frac{\$11S + \$9C}{11} \qquad \mathbf{J} \quad \frac{\$20C + \$9C}{11}$$

46 Using the Mathematics Chart, measure the dimensions of the rectangle to the nearest quarter inch. If this rectangle is the base of a rectangular prism 1 inch high, what is the volume of the rectangle?



47 The table below relates the number of possible games that can be scheduled among the *n* teams comprising a league.

Number of Teams (<i>n</i>)	Number of Games
2	1
3	3
4	6
5	10

Which expression tells how many games can be scheduled among *n* different teams?

F 2*n*
G
$$\frac{n(n-1)}{2}$$

H $n(n-3)$
J 2*n*-2

48 Terence cuts paper dolls for his niece. He folds a piece of paper in half a number of times and then cuts half a doll's figure along the fold line. The number of dolls he cuts is related to the number of folds he makes as shown in the chart.

Paper Folds/Paper Dolls

f	d
1	1
2	2
3	4
4	8
5	16

What relationship does the number of dolls, d, have to the number of folds, f?

A
$$d = 1 + (f-1)^2$$

B $d = 2^{(f-1)}$
C $d = 2f - 2$
D $d = 2^f$



Date

Benchmark Test 3 (continued)

- 49 Which expression is equivalent to
 - $5(x^2y^3)^2 + 5x^4?$ **F** $5x^4(y^6 + 1)$ **H** $10x^4y^6$ **G** $5x^4(y^5 + 1)$ **J** $25x^4(y^6 + 1)$
- **50** Jaime believes that a right triangle can also be an equilateral triangle. Kris says that's impossible. Which statement is NOT part of Kris' proof?
 - A An equilateral triangle has sides and angles with equal measure.
 - **B** The sum of the measures of all angles in a triangle is 180°.
 - **C** A right triangle has one angle that measures 90°.
 - **D** An obtuse triangle has one angle with greater measure than 90°.
- **51** How does the graph of $y = 4x^2$ differ from the graph of $y = 4x^2 + 3$?
 - **F** The graph of $y = 4x^2$ is translated three units to the right of $y = 4x^2 + 3$.
 - **G** The graph of $y = 4x^2$ is translated three units to the left of $y = 4x^2 + 3$.
 - **H** The graph of $y = 4x^2$ is shifted three units below the graph of $y = 4x^2 + 3$.
 - **J** The graph of $y = 4x^2$ is shifted three units above the graph of $y = 4x^2 + 3$.
- **52** Kevin's teacher asks him to simplify the expression $\frac{a^2 b^2}{a^2 ab} + \frac{a^2 b^2}{a b}$. Which statement does NOT describe a reasonable first step to simplify the expression?
 - **A** Factor $a^2 b^2$ in the numerator of the first term.
 - **B** Factor $a^2 b^2$ in the numerator of the second term.
 - **C** Add the numerator of the first term to the numerator of second term.
 - **D** Factor $a^2 ab$ in the denominator of the expression's first term.

53 Factor the expression below.

$$p^{2} - q^{2}$$
F $\sqrt{p^{2} - q^{2}}$
G $\frac{-p \pm \sqrt{q^{2} - 4}}{2}$
H $(p - q)^{2}$
J $(p + q)(p - q)$

54 Nancy tracks enrollment in the after-school program where she works after school. The graph shows the results.

Enrollment



What does the slope of this graph show about attendance in the after-school program?

- **A** Each week there is one fewer child.
- **B** Each week there are five fewer children.
- **C** The slope of the graph is 1.
- **D** In eight weeks there will be five children attending the after-school program.
- **55** If the solutions of a quadratic equation are x = -1 and x = 1, what are the coordinates of its roots?
 - **F** (-1, 0) and (1, 0)
 - **G** (-1, -1) and (1, 1)
 - **H** (0, -1) and (0, 1)
 - **J** (0, 0) and (-1, 1)



56 A couple spent \$12 to put mulch and flowers in their front yard. The mulch costs \$4 per bag, and a flat of flowers costs \$2. The couple bought 4 times as many flats of flowers as bags of mulch. Set up and solve a system of equations with *x* being the number of flats of flowers purchased and *y* being the number of mulch bags bought. Which is the solution?

Α	(4, 1)	С	(1, 12)
В	(3, 6)	D	(1, 4)

- **57** Which of the following situations can be represented by a linear function?
 - **F** the amount of money in Jared's bank account if he saves \$1000 the first year, \$2000 the second year, \$3000 the third, and continues with that pattern
 - **G** the amount of petroleum needed to fill a series of tankers as a function of *r*, the radius of the tanks
 - **H** the number of shirts Tara owns, if she buys exactly 2 shirts per month
 - J the number of days it will take to eat leftover birthday cake, if each day half of the remaining cake is eaten

58 A portion of a polygon is shown on the graph.



Which of these coordinates for vertex *T* would complete a concave polygon?

Α	(-3, -1)	С	(-3, 2)
В	(-3, 0)	D	(0, -1)

59 The chart shows gasoline prices over a year's time. Based on the information in the graph, which conclusion is NOT true?

Average Retail Gasoline Prices



- **F** Throughout the year, the three grades of gasoline stayed about the same distance apart in price.
- **G** Gasoline prices reached their peak between August and October.
- **H** When prices rose in February and March, the prices of three grades of gasoline grew at about the same rate.
- J When prices declined from October to December, premium grade gasoline dropped at a faster rate than the other grades.
- **60** Martin has two empty ice cream cones. The first has a height of 3 inches and a base diameter of 1 inch. The second has a height of 4 inches and a base diameter of 2 inches. What is the difference between the volumes of the two cones, rounded to the nearest tenth of an inch?
 - **A** 1.1 in.^3
 - **B** 3.4 in.³
 - **C** 4.4 in.^3
 - **D** 10.2 in.^3

