Lesson F

Compensation and Deductions

Use after Lesson 13-5

Goals　■ Solve problems involving compensation and deductions.

Applications　Finance, Employment

Refer to the table below to answer the following questions.

Pay Earned (p)	$173	$216.25	$259.50	$302.75
Hours Worked (h)	20	25	30	35

a. Find the ratio of pay earned to hours worked for each pair of values.

b. Write an equation for p as a function of h.

◣ BUILD UNDERSTANDING

You can use rates to solve problems with compensation and deductions.

Example 1

JOBS　**Isaac has a part-time job at a grocery store. His time card is shown below.**

Day	Time In	Time Out	Hours	Pay
Monday	4:00	7:00	3	$21
Tuesday	4:00	8:00	4	28
Wednesday	4:00	7:00	3	21
Thursday			0	0
Friday	4:00	8:00	4	28
Saturday	12:00	8:00	8	56
Sunday			0	0
TOTAL			22	$154

What is Isaac's rate of pay in dollars per hour?

Solution

First determine the total number of hours that Isaac worked.

$3 + 4 + 3 + 4 + 8 = 22$

Next determine the total amount paid. This is $154.

To find the rate of pay, divide: $154 \div 22 = 7$.

Isaac's rate of pay is $7 per hour.

Lesson F **Compensation and Deductions**

Example 2

Refer to Example 1. Isaac's employer withholds 10% of his earnings for taxes. What is his pay after taxes are deducted?

Solution

We know that Isaac earns $7 per hour. To find his pay after taxes are deducted, first find 10% of his pay rate.

$7 \times 0.10 = 0.70$

So, $0.70 is deducted from Isaac's pay per hour. His pay rate after taxes are deducted is $6.30 per hour.

The relationship between the hours worked and the amount earned is an example of direct variation. Deductions can also be represented by a direct variation. The rate of discount is directly proportional to the amount of the discount.

Example 3

PAYCHECKS The gross pay for working 485 hours is $3637.50 and $654.75 is deducted from the paycheck.
   a. Determine the equation of direct variation for pay.
   b. Determine the equation of direct variation for deductions.

Solution

a. First find the constant of variation. To do this, calculate the dollars paid per hour of work.

   $3637.50 \div 485 = \$7.50$ per hour

   Next, write the equation of direct variation. Let $y =$ the amount earned and $x =$ the hours worked.

   $y = 7.5x$

b. The constant of variation is the rate of deductions. To determine this, divide.

   $\dfrac{654.75}{3637.50} = 0.18$

   The constant of variation is 0.18. We can write the equation of direct variation. Let $y =$ the amount of the deductions and $x =$ the amount earned.

   $y = 0.18x$

◣ TRY THESE EXERCISES

1. Miguel worked 229 hours and earned $2576.25. What is his rate of pay?
2. Jordana earned $646.20 for working 76 hours. What is her rate of pay?
3. Tyra is paid $12.50 per hour. If she has 15% of her income deducted, what is her net pay rate per hour?

Lesson F **Compensation and Deductions**

4. Nate is paid $9 per hour. If he has 15% of his income deducted, what is his net pay rate per hour?

5. If the pay for working 40 hours is $340, determine the equation of direct variation.

6. If you earn $189 for working 28 hours, determine the equation of direct variation.

PRACTICE EXERCISES

7. Pilar worked 188 hours and earned $1833. What is her rate of pay?

8. Tom earned $961 for working 62 hours. What is his rate of pay?

9. Carlie is paid $6.25 per hour. If she has 10% of her income deducted, what is her net pay rate per hour?

10. Terrence is paid $15.75 per hour. If he has 20% of his income deducted, what is his net pay rate per hour?

11. If the pay for working 25 hours is $360, determine the equation of direct variation.

12. If you earn $313.20 for working 36 hours, determine the equation of direct variation.

PAYCHECK **For Exercises 13-20, use the following information.**

The table below shows compensation and several deductions for one pay period.

Compensation:		Deductions:	
Hours:	80	Federal Income Tax:	$193.82
		State Income Tax:	48.46
Gross Pay:	$1076.80	Local Income Tax:	16.15
Net Pay:	$729.76	Retirement Contribution:	64.61
		Health Insurance:	24.00
		Total Deductions:	$347.04

13. Determine the hourly rate of gross pay.

14. Determine the hourly rate of net pay.

15. What is the rate of total deductions?

16. Determine the rate of taxes deducted from the gross pay.

17. Write the equation of direct variation for gross pay.

18. Write the equation of direct variation for net pay.

19. Write the equation of direct variation for retirement contributions.

20. Write the equation of direct variation for total deductions.

EMPLOYMENT **For Exercises 21–24, use the following information.**

Kensi has her union dues deducted from her paycheck each month. She works 200 hours per month and earns $2,000 per month. Her union dues cost $20 per month.

21. Determine Kensi's hourly pay rate.

22. Determine her deduction rate.

23. What is the equation of direct variation representing her earnings (before deductions)?

24. What is the equation of direct variation representing her take-home pay (after deductions)?

Lesson F **Compensation and Deductions**

TAXES For Exercises 25–30, use the following information.

The Internal Revenue Service provides this table to estimate your Federal Income Tax. Determine the percentage of income that should be deducted given each yearly income. Round to the nearest tenth if necessary.

If taxable income is:		The tax is:	of the amount over—
Over—	But not over—		
$0	$7,300	10%	$0
7,300	29,700	730 + 15%	7,300
29,700	71,950	4,090.00 + 25%	29,700

Source: Internal Revenue Service

25. $6,500

26. $25,000

27. $38,500

28. $4,255

29. $12,675

30. $59,875

COST OF LIVING For Exercises 31 and 32, use the following information.

The cost of living index compares how much it costs to live in different cities. Cities are assigned a number based on the cost of housing, groceries, utilities, and other factors. Use proportions to compare the indexes of cities and the salaries in those cities. Round to the nearest dollar.

31. Determine the rate of increase in cost of living if moving from Dallas to Chicago.

32. Mr. Jones earns $64,000 in Topeka. He has a job offer in Chicago for $78,500. Use the cost of living index to determine if this increase is reasonable. Justify your answer.

Cost of Living Index

City	Index
New York City, New York	212.1
Chicago, Illinois	128.6
Atlanta, Georgia	97.2
Montgomery, Alabama	96.1
Dallas, Texas	95.2
Topeka, Kansas	92.0

Source: infoplease.com

33. WRITING MATH Suki receives discounted prices on items purchased at the store at which she is employed. Analyze the data in the chart to determine if the rate of the discount is a constant of variation. Justify your answer.

Retail Price ($)	69	149	199	249	599	799
Discount Price ($)	65	140	187	234	563	751

EXTENDED PRACTICE EXERCISES

SALES Ms. Hernandez is a sales representative. She earns a salary plus a commission on the product she sells. Her salary is $65,000 per year and her commission is 5% of sales.

34. Determine her annual salary if she had $90,500 in sales for the year.

35. Write a linear function to represent her earnings.