

Lesson 3-4

Example 1

Solve each equation. Check the solution.

a. $\frac{n}{2} + 3 = 5$

b. $4t - 8 = 20$

Solution

a. $\frac{n}{2} + 3 = 5$

$$\frac{n}{2} + 3 + (-3) = 5 + (-3)$$

$$\frac{n}{2} = 2$$

$$2 \cdot \frac{n}{2} = 2(2)$$

$$n = 4$$

b. $4t - 8 = 20$

$$4t - 8 + 8 = 20 + 8$$

$$4t = 28$$

$$\frac{4t}{4} = \frac{28}{4}$$

$$t = 7$$

Check $\frac{n}{2} + 3 = 5$

$$\frac{4}{2} + 3 \stackrel{?}{=} 5$$

$$2 + 3 \stackrel{?}{=} 5$$

$$5 = 5 \quad \checkmark$$

Check $4t - 8 = 20$

$$4(7) - 8 \stackrel{?}{=} 20$$

$$28 - 8 \stackrel{?}{=} 20$$

$$20 = 20 \quad \checkmark$$

Example 2

Solve each equation. Check the solution.

a. $4x + 2 - x + 7 = 18$

b. $3(a + 1) = 2(a + 4)$

Solution

a. $4x + 2 - x + 7 = 18$

$(4x - x) + (2 + 7) = 18$

$3x + 9 = 18$

$3x + 9 - 9 = 18 - 9$

$3x = 9$

$\frac{3x}{3} = \frac{9}{3}$

$x = 3$

Combine like terms.

Subtract 9 from each side.

Divide each side by 3.

Check $4x + 2 - x + 7 = 18$

$4(3) + 2 - 3 + 7 \stackrel{?}{=} 18$

$12 + 2 - 3 + 7 \stackrel{?}{=} 18$

$14 - 3 + 7 \stackrel{?}{=} 18$

$11 + 7 \stackrel{?}{=} 18$

$18 = 18 \checkmark$

b. $3(a + 1) = 2(a + 4)$

$3a + 3 = 2a + 8$

$3a - 2a + 3 = 2a - 2a + 8$

$a + 3 = 8$

$a + 3 - 3 = 8 - 3$

$a = 5$

Distribute 3 and 2.

Subtract $2a$ from each side.

Subtract 3 from each side.

Check $3(a + 1) = 2(a + 4)$

$3(5 + 1) \stackrel{?}{=} 2(5 + 4)$

$3(6) \stackrel{?}{=} 2(9)$

$18 = 18 \checkmark$

Example 3In the formula $H = \frac{b}{5} + 75$, solve for b .**Solution**

$H = \frac{b}{5} + 75$

$H - 75 = \frac{b}{5} + 75 - 75$

Subtract 75 from each side.

$H - 75 = \frac{b}{5}$

$5(H - 75) = 5 \cdot \frac{b}{5}$

Multiply each side by 5.

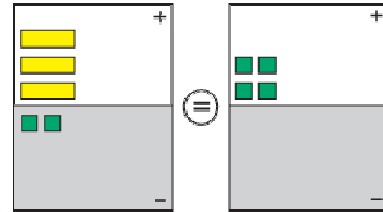
$5(H - 75) = b$

Example 4

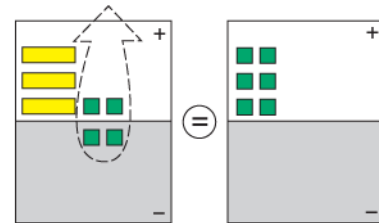
MODELING Solve the equation $3y - 2 = 4$ using Algeblocks.

Solution

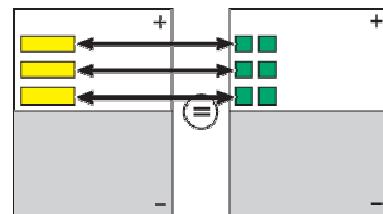
Step 1 Model the equation on a Sentence Mat.



Step 2 Add 2 to both sides of the Mat. Then remove the zero pairs.



Step 3 There are three y -blocks. Make the six unit blocks into three equal pairs.



Read the answer for $1y$ from the Mat, $y = 2$.