

Key Terms

Equation – A mathematical statement in which one expression equals another.

Example: $x - 2 = 5$

Solution – A value of a variable that makes an equation true.

Example: 7 is a solution to $x - 2 = 5$, since $7 - 2 = 5$

Solving an equation – The process of finding the solution to an equation.

Example: $x - 2 = 5$

$$\begin{array}{r} +2 \quad +2 \\ x = 7 \end{array}$$

Equivalent equation – Equations that have the same solution.

Example: $x = 7$ and $x - 2 = 5$ are equivalent equations.

Equations can be solved by making changes to both sides until the variable is alone on one side and the solution is alone on the other side.

In changing an equation to solve it, you must **do to one side what you do to the other side.**

Examples – Solve the equations

a. $2x + 8 = 2$

$2x + 8 - 8 = 2 - 8$ subtract 8 from each side

$2x = -6$

$\frac{2x}{2} = \frac{-6}{2}$ divide both sides by 2

$x = -3$

Check your answer. Substitute -3 for x .

a. $2(-3) + 8 = 2$

$-6 + 8 = 2$

$2 = 2$

Yes, $x = -3$ is the solution.

b. $3x = 24$

$\frac{3x}{3} = \frac{24}{3}$ divide both sides by 3

$x = 8$

Check your answer.

a. $3(8) = 24$

$24 = 24$

Yes, $x = 8$ is the solution.

c. $2 + 5x = 12$

$2 + 5x - 2 = 12 - 2$ subtract 2 from each side

$5x = 10$

$$\frac{5x}{5} = \frac{10}{5}$$

divide both sides by 5

$$x = 2$$

Check your answer.

a. $2 + 5(2) = 12$

$$2 + 10 = 12$$

$$12 = 12 \quad \text{Yes, } x = 2 \text{ is the solution.}$$

Solving equations about geometric figures

You can write and solve equations to find unknown measures in geometric figures.

Example

The perimeter of the parallelogram below is 70 in. Find the value of x .

Solution:

Write an equation for the perimeter.

$$2(x) + 2(15) = 70$$

$$2x + 30 = 70$$

$$\begin{array}{r} -30 \\ -30 \end{array}$$

$$2x = 40$$

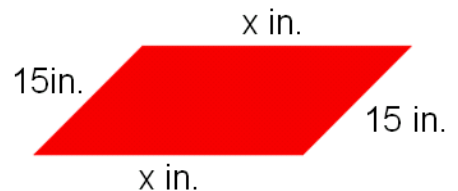
$$\frac{2x}{2} = \frac{40}{2}$$

$$x = 20$$

Simplify the left side.

Subtract 30 from both sides.

Divide both sides by 2



Example

Write and solve an equation to find each unknown measure in each figure. Remember, the sum of the measures of the angles of a quad is 360° . Also, pictures are not drawn to scale.

a. Solution

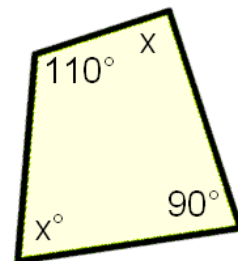
$$110 + x + 90 + x = 360$$

$$200 + 2x = 360$$

$$\begin{array}{r} -200 \\ -200 \end{array} \quad \text{Subtract 200 from both sides.}$$

$$2x = 160 \quad \text{Divide both sides by 2}$$

$$x = 80^\circ$$



2-7 Solving Equations: Balancing

b. Solution

$$x + 4x + 90 = 180$$

$$5x + 90 = 180 \quad \text{Combine like terms}$$

$$\quad -90 \quad -90 \quad \text{Subtract 90 from both sides}$$

$$5x = 90$$

$$x = 18 \quad \text{Divide both sides by 5}$$

$$x = 18^\circ \text{ and } 4x = 72^\circ$$

c. Perimeter = 71m

Solution

$$18 + b + 20 + 2b = 71$$

$$38 + 3b = 71 \quad \text{Combine like terms}$$

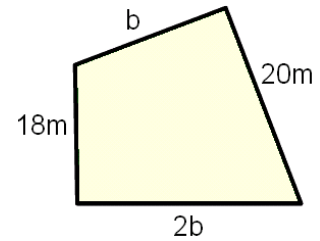
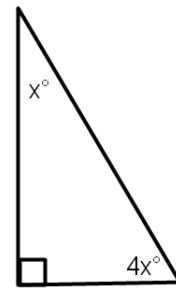
$$\quad -38 \quad -38 \quad \text{Subtract 38 from both sides.}$$

$$3b = 33$$

$$b = 11 \quad \text{Divide both sides by 3}$$

The missing side measures are 11m and 22m.

Integrated 1



Homework

Read pg. 99-102

Pg. 103 #13- 16, 19-25

Practice 15 #1-27