NAME _____ DATE Key PERIOD _____

2-1 Notes
Writing Equations

Write Equations Writing equations is one strategy for solving problems. You can use a variable to represent an unspecified number or measure referred to in a problem. Then you can write a verbal expression as an algebraic expression.

Example 1: Translate each sentence into an equation or a formula.

a. Ten times a number x is equal to 2.8 times the difference y minus z.

$10x = 2.8(y - z)$

b. A number m minus 8 is the same as a number n divided by 2.

$m - 8 = \frac{n}{2}$

c. The area of a rectangle equals the length times the width. Translate this sentence into a formula.

$A = LW$

Example 2: Use the Four-Step Problem-Solving Plan.

POPULATION The population of the United States in July 2007 was about 301,000,000, and the land area of the United States is about 3,500,000 square miles. Find the average number of people per square mile in the United States.

① Read: what do we know
pop = 301,000,000
land = 3,500,000

② Plan: what do we want to find?
Avg. # ppl per square mile

③ Solve: Avg = $\frac{\text{total ppl}}{\text{total land}}$

$= \frac{301,000,000}{3,500,000}$

$= 86$ ppl per square mile

④ Check

$86(3,500,000) = 301,000,000$ ✓

Exercises

Translate each sentence into an equation or formula.

1. Three times a number t minus twelve equals forty. $3t - 12 = 40$

2. One–half of the difference of a and b is 54. $\frac{1}{2}(a - b) = 54$

3. Three times the sum of d and 4 is 32. $3(d + 4) = 32$

4. The area A of a circle is the product of π and the radius r squared. $A = \pi r^2$

5. **WEIGHT LOSS** Lou wants to lose weight to audition for a part in a play. He weighs 160 pounds now. He wants to weigh 150 pounds.

   a. If p represents the number of pounds he wants to lose, write an equation to represent this situation.

   $160 - p = 150$

   b. How many pounds does he need to lose to reach his goal?

   $160 - p = 150$
   $-160 \quad -160$
   $\frac{-p}{-1} = \frac{-10}{-1}$

   $p = 10$ lbs

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2-2 Notes

Solving One-Step Equations

Solve Equations Using Addition and Subtraction

Solve each equation. Check your solution.

1. $h - 3 = -2$

$+3 \quad +3$

$h = 1$

Check

$1 - 3 = -2$

$-2 = -2$ ✓

2. $m + (-12) = 10$

$+12 \quad +12$

$m = -2$

Check

$-2 + 12 = 10$

$10 = 10$ ✓

3. $20 = y - 8$

$+8 \quad +8$

$28 = y$

4. $w + \frac{3}{2} = \frac{5}{8}$

$-\frac{3}{2} \quad -\frac{3}{2}$

$w = \frac{5}{8} - \frac{3 \cdot 4}{2 \cdot 4}$

$w = \frac{5}{8} - \frac{12}{8}$

$w = \frac{-7}{8}$

Solve Equations Using Multiplication and Division

Example 1: Solve $3\frac{1}{2}p = 1\frac{1}{2}$.

Step 1: $3\frac{1}{2} = \frac{7}{2}$

$1\frac{1}{2} = \frac{3}{2}$

Step 2: $\frac{7}{2}p = \frac{3}{2}$

Step 3: $\frac{2}{7}\left(\frac{7}{2}p\right) = \frac{3}{2} \cdot \frac{2}{7}$

$p = \frac{6}{14}$

$p = \frac{3}{7}$

Example 2: Solve $-5n = 60$.

$\frac{-5}{-5} = -5$

$n = -12$

Exercises

Solve each equation. Check your solution.

1. $\frac{h}{3} = -2$ $\cdot 3$

$h = -6$

3. $\frac{1}{5}p = \frac{3}{5}$ $\cdot \frac{5}{1}$

$p = \frac{15}{5}$

$p = 3$

4. $5 = \frac{y}{12}$ $\cdot 12$

$60 = y$

6. $-\frac{m}{8} = \frac{5}{8}$ $\cdot -8$

$m = -\frac{40}{8}$

$m = -5$