Name _____ Date _____ Class _____

LESSON 2-5

Practice B

Solving for a Variable

Answer each of the following.

1. The formula $C = 2\pi r$ relates the radius r of a circle to its circumference C. Solve the formula for r.

_____

2. The formula $y = mx + b$ is called the slope-intercept form of a line. Solve this formula for m.

_____

Solve each equation for the variable indicated.

3. $4c = d$ for c

_____

4. $n - 6m = 8$ for n

_____

5. $2p + 5r = q$ for p

_____

6. $-10 = xy + z$ for x

_____

7. $\frac{a}{b} = c$ for b

_____

8. $\frac{h - 4}{j} = k$ for j

_____

Answer each of the following.

9. The formula $c = 5p + 215$ relates c, the total cost in dollars of hosting a birthday party at a skating rink, to p, the number of people attending.

a. Solve the formula $c = 5p + 215$ for p. _____

b. If Allie's parents are willing to spend $300 for a party, how many people can attend? _____

10. The formula for the area of a triangle is $A = \frac{1}{2}bh$, where b represents the length of the base and h represents the height.

a. Solve the formula $A = \frac{1}{2}bh$ for b. _____

b. If a triangle has an area of 192 mm^2, and the height measures 12 mm, what is the measure of the base? _____

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LESSON 2-5

Practice A

Solving for a Variable

Answer each of the following.

1. The formula $K = C + 273$ is used to convert temperatures from degrees Celsius to Kelvin. Solve this formula for C.

$C = K - 273$

2. The formula $T = \frac{1}{f}$ relates the period of a sound wave T to its frequency f. Solve this formula for f.

$f = \frac{1}{T}$

Solve each equation for the variable indicated.

3. $x = 5y$ for y

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

4. $s + 4t = r$ for s

$s = r - 4t$

5. $3m - 7n = p$ for m

$m = \frac{p + 7n}{3}$

6. $6 = hj + k$ for j

$j = \frac{6 - k}{h}$

7. $\frac{v}{w} = 9$ for w

$w = \frac{v}{9}$

8. $\frac{a + 3}{b} = c$ for a

$a = bc - 3$

Answer each of the following.

9. The formula $d = rt$ relates the distance an object travels d, to its average rate of speed r, and amount of time t that it travels.

   a. Solve the formula $d = rt$ for t.

$t = \frac{d}{r}$

   b. How many hours would it take for a car to travel 150 miles at an average rate of 50 miles per hour?

3

10. The formula $F - E + V = 2$ relates the number of faces F, edges E, and vertices V, in any convex polyhedron.

   a. Solve the formula $F - E + V = 2$ for F.

$F = 2 + E - V$

   b. How many faces does a polyhedron with 20 vertices and 30 edges have?

12

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LESSON 2-5

Practice B

Solving for a Variable

Answer each of the following.

1. The formula $C = 2\pi r$ relates the radius r of a circle to its circumference C. Solve the formula for r.

$r = \frac{C}{2\pi}$

2. The formula $y = mx + b$ is called the slope-intercept form of a line. Solve this formula for m.

$m = \frac{y - b}{x}$

Solve each equation for the variable indicated.

3. $4c = d$ for c

$c = \frac{d}{4}$

4. $n - 6m = 8$ for n

$n = 8 + 6m$

5. $2p + 5r = q$ for p

$p = \frac{q - 5r}{2}$

6. $-10 = xy + z$ for x

$x = \frac{-10 - z}{y}$

7. $\frac{a}{b} = c$ for b

$b = \frac{a}{c}$

8. $\frac{h - 4}{j} = k$ for j

$j = \frac{h - 4}{k}$

Answer each of the following.

9. The formula $c = 5p + 215$ relates c, the total cost in dollars of hosting a birthday party at a skating rink, to p, the number of people attending.

   a. Solve the formula $c = 5p + 215$ for p.

$p = \frac{c - 215}{5}$

   b. If Allie's parents are willing to spend $300 for a party, how many people can attend?

17

10. The formula for the area of a triangle is $A = \frac{1}{2}bh$, where b represents the length of the base and h represents the height.

   a. Solve the formula $A = \frac{1}{2}bh$ for b.

$b = \frac{2A}{h}$

   b. If a triangle has an area of 192 mm^2, and the height measures 12 mm, what is the measure of the base?

32 mm

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LESSON 2-5

Practice C

Solving for a Variable

Answer each of the following.

1. The formula $P = 2l + 2w$ relates the perimeter P of a rectangle to its length l and width w. Solve this formula for w.

$w = \frac{P - 2l}{2}$

2. The formula $a = \frac{v_f - v_i}{t}$ is used to find an object's acceleration given initial velocity v_i, final velocity v_f, and time t. Solve this formula for v_f.

$v_f = at + v_i$

Solve each literal equation for the variable indicated.

3. $-3f = g$ for f

$f = \frac{g}{-3}$

4. $12 = a + 5b$ for a

$a = 12 - 5b$

5. $3x - 7y = z$ for x

$x = \frac{z + 7y}{3}$

6. $5h - g = jk$ for h

$h = \frac{jk + g}{5}$

7. $\frac{r}{s} = t - 9$ for r

$r = s(t - 9)$

8. $\frac{m + 3}{n} = p$ for n

$n = \frac{m + 3}{p}$

Answer each of the following.

9. The formula $F = ma$ relates the force F exerted on an object, to the object's mass m, and acceleration a.

   a. Solve the formula $F = ma$ for a.

$a = \frac{F}{m}$

   b. Suppose a shot-putter exerts a force of 123.5 kg • m/s^2 on a shot that has a mass of 6.5 kg. What is the rate of acceleration of the shot? (The answer will be in m/s^2.)

19 m/s^2

10. The formula $I = Prt$ can be used to determine the interest I that is earned on a principal amount of money P, when the money is invested at an annual percentage rate r for t years.

   a. Solve the formula $I = Prt$ for t.

$t = \frac{I}{Pr}$

   b. If a couple invests $5000 in an account that earns a 3% interest rate, how long will they need to invest it to earn $1200 in interest? (*Hint*: Convert the interest rate to a decimal.)

8 years

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LESSON 2-5

Reteach

Solving for a Variable

Solving for a variable in a formula can make it easier to use that formula. The process is similar to that of solving multi-step equations. Find the operations being performed on the variable you are solving for, and then use inverse operations.

	Operations	Solve using Inverse Operations
$A = lw$ Solve for w.	• w is multiplied by l.	• Divide both sides by l.
$P = 2l + 2w$ Solve for w.	• w is multiplied by 2. • Then $2l$ is added.	• Add $-2l$ to both sides. • Then divide both sides by 2.

The order of the inverse operations is the order of operations in reverse.

The formula $A = \frac{1}{2}bh$ relates the area A of a triangle to its base b and height h. Solve the formula for b.

$A = \frac{1}{2}bh$	b is multiplied by $\frac{1}{2}$.
$\left(\frac{2}{1}\right) \cdot A = \left(\frac{2}{1}\right)\frac{1}{2}bh$	Multiply both sides by $\frac{2}{1}$.
$2A = bh$	b is multiplied by h.
$\frac{2A}{h} = \frac{bh}{h}$	Divide both sides by h.
$\frac{2A}{h} = b$	Simplify.

Solve for the indicated variable.

1. $P = 4s$ for s

$s = \frac{P}{4}$

2. $a + b + c = 180$ for b

$b = 180 - a - c$

3. $P = \frac{KT}{V}$ for K

$K = \frac{VP}{T}$

The formula $V = \frac{1}{3}lwh$ relates the volume of a square pyramid to its base length l, base width w, and height h.

4. Solve the formula for w.

$w = \frac{3V}{lh}$

5. A square pyramid has a volume of 560 in^3, a base length of 10 in., and a height of 14 in. What is its base width?

12 in.

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