

Solve each equation or formula for the variable indicated.

1.  $5a + c = -8a$ , for  $a$

2.  $7h + f = 2h + g$ , for  $g$

3.  $\frac{k + m}{-7} = n$ , for  $k$

4.  $q = p(r + s)$ , for  $p$

8.  $u = vw + z$ , for  $v$

9.  $x = b - cd$ , for  $c$

10.  $fg - 9h = 10j$ , for  $g$

11.  $10m - p = -n$ , for  $m$

12.  $r = \frac{2}{3}t + v$ , for  $t$

13.  $\frac{5}{9}v + w = z$ , for  $v$

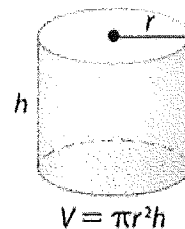
14.  $\frac{10ac - x}{11} = -3$ , for  $a$

15.  $\frac{df + 10}{6} = g$ , for  $f$

5. **PACKAGING** A soap company wants to use a cylindrical container to hold their new liquid soap.

a. Solve the formula for  $h$ .

b. What is the height of a container if the volume is 56.52 cubic inches and the radius is 1.5 inches? Round to the nearest tenth.



16. **FITNESS** The formula to compute a person's body mass index is  $B = 703 \cdot \frac{w}{h^2}$ .

$B$  represents the body mass index,  $w$  is the person's weight in pounds, and  $h$  represents the person's height in inches.

a. Solve the formula for  $w$ .

b. What is the weight to the nearest pound of a person who is 64 inches tall and has a body mass index of 21.45?

28. **DANCING** The formula  $P = \frac{1.2W}{H^2}$  represents the amount of pressure exerted on the floor by a ballroom dancer's heel. In this formula,  $P$  is the pressure in pounds per square inch,  $W$  is the weight of a person wearing the shoe in pounds, and  $H$  is the width of the heel of the shoe in inches.

a. Solve the formula for  $W$ .

b. Find the weight of the dancer if the heel is 3 inches wide and the pressure exerted is 30 pounds per square inch.

Solve each equation or formula for the variable indicated.

$$1. \frac{5a + c}{-5a} = \frac{-8a}{-5a}, \text{ for } a$$

$$\frac{c}{-13} = \frac{-13a}{-13}$$

$$-\frac{1}{13}c = a$$

$$3. \left[ \frac{k+m}{-7} \right] = n, \text{ for } k$$

$$\frac{k+m}{-m} = \frac{-7n}{-m}$$

$$k = -7n - m$$

$$8. u = vw + z, \text{ for } v$$

$$\frac{u-z}{w} = \frac{vw}{w}$$

$$\frac{u-z}{w} = v$$

$$10. fg - 9h = 10j, \text{ for } g$$

$$\frac{fg}{f} = \frac{10j+9h}{f}$$

$$g = \frac{10j+9h}{f}$$

$$12. r = \frac{2}{3}t + v, \text{ for } t$$

$$\frac{3}{2}(r-v) = \frac{2}{3}t \left( \frac{3}{2} \right)$$

$$\frac{3}{2}(r-v) = t$$

$$14. \left[ \frac{10ac - x}{11} \right] = -3, \text{ for } a$$

$$\frac{10ac - x}{10c} = \frac{x - 33}{10c}$$

$$a = \frac{x - 33}{10c}$$

$$2. 7h + f = 2h + g, \text{ for } g$$

$$5h + f = g$$

$$4. \frac{q}{r+s} = \frac{p(r+s)}{r+s}, \text{ for } p$$

$$\frac{q}{r+s} = p$$

$$9. x = b - cd, \text{ for } c$$

$$\frac{x-b}{-d} = \frac{-cd}{-d}$$

$$\frac{x-b}{-d} = c \quad \text{or} \quad c = \frac{b-x}{d}$$

$$11. 10m - p = -n, \text{ for } m$$

$$\frac{10m}{10} = \frac{p-n}{10}$$

$$m = \frac{p-n}{10}$$

$$13. \frac{5}{9}v + w = z, \text{ for } v$$

$$\left( \frac{9}{5} \right) \frac{5}{9}v = (z-w) \left( \frac{9}{5} \right)$$

$$v = \frac{9}{5}(z-w)$$

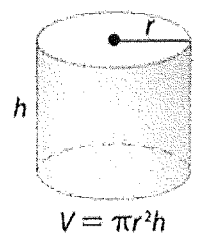
$$15. \left[ \frac{df+10}{6} \right] = g, \text{ for } f$$

$$\frac{df+10}{d} = \frac{6g}{d}$$

$$f = \frac{6g-10}{d}$$

Key

5. PACKAGING A soap company wants to use a cylindrical container to hold their new liquid soap.



- a. Solve the formula for  $h$ .
- b. What is the height of a container if the volume is 56.52 cubic inches and the radius is 1.5 inches? Round to the nearest tenth.

(a)  $V = \frac{\pi r^2 h}{\pi r^2}$   
 $h = \frac{V}{\pi r^2}$

(b)  $V = 56.52$     $r = 1.5$   
 $h = \frac{56.52}{\pi \cdot (1.5)^2}$   
 $h = 8 \text{ inches}$

16. FITNESS The formula to compute a person's body mass index is  $B = 703 \cdot \frac{w}{h^2}$ .

$B$  represents the body mass index,  $w$  is the person's weight in pounds, and  $h$  represents the person's height in inches.

- a. Solve the formula for  $w$ .
- b. What is the weight to the nearest pound of a person who is 64 inches tall and has a body mass index of 21.45?

(a)  $B = \frac{703w}{h^2} \cdot h^2$   
 $\frac{Bh^2}{703} = \frac{703w}{703}$   
 $w = \frac{Bh^2}{703}$

(b)  $h = 64$   
 $B = 21.45$   
 $w = \frac{21.45 \cdot 64^2}{703}$   
 $w = 125 \text{ lbs}$

28. DANCING The formula  $P = \frac{1.2W}{H^2}$  represents the amount of pressure exerted on the floor by a ballroom dancer's heel. In this formula,  $P$  is the pressure in pounds per square inch,  $W$  is the weight of a person wearing the shoe in pounds, and  $H$  is the width of the heel of the shoe in inches.

- a. Solve the formula for  $W$ .
- b. Find the weight of the dancer if the heel is 3 inches wide and the pressure exerted is 30 pounds per square inch.

(a)  $P = \frac{1.2W}{H^2} \cdot H^2$   
 $\frac{PH^2}{1.2} = \frac{1.2W}{1.2}$   
 $W = \frac{PH^2}{1.2}$

(b)  $P = 30$     $H = 3$   
 $W = \frac{30 \cdot 3^2}{1.2}$   
 $W = 225 \text{ lbs}$

# CRYPTIC QUIZ

1. Why did the little girl paint spots on the staircase?

Answer: \_\_\_\_\_

14 7 4 3 11 14 11 14 15 4 1 9 2 15 15 4 12

2. What do you call a thirty-six-inch two-by-four?

Answer: \_\_\_\_\_

11 10 6 13 8 4 12 5 11 12 9

*Answers on the  
Back.*

Solve each equation for  $y$  in terms of  $x$ . Find your answer below and notice the letter next to it. Each time the exercise number appears in the code, write this letter above it.

①  $x + y = 5$

②  $-3x + y = -2$

③  $x - y = 7$

④  $-4x - y = 1$

⑤  $3x - y = -10$

⑥  $-x + 2y = 6$

⑦  $x - 2y = 2$

⑧  $-2x + 3y = -12$

⑨  $5x + 2y = 1$

⑩  $4x - 3y = -2$

⑪  $3x + 2y - 6 = 0$

⑫  $x - 4y + 2 = 0$

⑬  $-2x - 6y = 0$

⑭  $8y - 3x = -6$

⑮  $7x = 2y$

Answers:

(E)  $y = -4x - 1$

(F)  $y = 3x - 1$

(P)  $y = -x + 5$

(W)  $y = x - 7$

(Y)  $y = 3x + 10$

(O)  $y = 3x - 2$

Answers:

(D)  $y = -\frac{5}{2}x + \frac{1}{2}$

(U)  $y = \frac{1}{2}x + 3$

(L)  $y = \frac{4}{3}x + \frac{2}{3}$

(G)  $y = \frac{3}{4}x - 4$

(H)  $y = \frac{1}{2}x - 1$

(B)  $y = \frac{2}{3}x - 4$

Answers:

(N)  $y = \frac{4}{3}x + \frac{1}{4}$

(S)  $y = \frac{3}{8}x - \frac{3}{4}$

(R)  $y = \frac{1}{4}x + \frac{1}{2}$

(A)  $y = -\frac{3}{2}x + 3$

(T)  $y = \frac{7}{2}x$

(M)  $y = -\frac{1}{3}x$

Key

# CRYPTIC QUIZ

1. Why did the little girl paint spots on the staircase?

Answer:

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2. What do you call a thirty-six-inch two-by-four?

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Answers on the Back.

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- ⑥  $-x + 2y = 6$
- ⑦  $x - 2y = 2$
- ⑧  $-2x + 3y = -12$
- ⑨  $5x + 2y = 1$
- ⑩  $4x - 3y = -2$

- ⑪  $3x + 2y - 6 = 0$
- ⑫  $x - 4y + 2 = 0$
- ⑬  $-2x - 6y = 0$
- ⑭  $8y - 3x = -6$
- ⑮  $7x = 2y$

$$\begin{aligned} \textcircled{1} \quad x + y &= 5 \\ y &= 5 - x \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad -3x + y &= -2 \\ y &= 3x - 2 \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad x - y &= 7 \\ -y &= 7 - x \\ \hline -1 & \\ y &= x - 7 \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad -4x - y &= 1 \\ -y &= 1 + 4x \\ \hline -1 & \\ y &= -1 - 4x \end{aligned}$$

$$\begin{aligned} \textcircled{5} \quad 3x - y &= -10 \\ [-y &= -10 - 3x] \div -1 \\ y &= 10 + 3x \end{aligned}$$

$$\begin{aligned} \textcircled{6} \quad -x + 2y &= 6 \\ 2y &= 6 + x \\ y &= \frac{6+x}{2} \text{ or } y = 3 + \frac{1}{2}x \end{aligned}$$

$$\begin{aligned} \textcircled{7} \quad x - 2y &= 2 \\ -2y &= 2 - x \\ y &= \frac{2-x}{-2} \text{ or } -1 + \frac{1}{2}x \end{aligned}$$

$$\begin{aligned} \textcircled{8} \quad -2x + 3y &= -12 \\ 3y &= 2x - 12 \\ y &= \frac{2x-12}{3} \text{ or } \frac{2}{3}x - 4 \end{aligned}$$

$$\begin{aligned} \textcircled{9} \quad 5x + 2y &= 1 \\ 2y &= 1 - 5x \\ y &= \frac{1-5x}{2} \text{ or } \frac{1}{2} - \frac{5}{2}x \end{aligned}$$

$$\begin{aligned} \textcircled{10} \quad 4x - 3y &= -2 \\ -3y &= -4x - 2 \\ y &= \frac{-4x-2}{-3} \text{ or } \frac{4}{3}x + \frac{2}{3} \end{aligned}$$

$$\begin{aligned} \textcircled{11} \quad 2y &= 6 - 3x \\ y &= \frac{6-3x}{2} \text{ or } 3 - \frac{3}{2}x \end{aligned}$$

$$\begin{aligned} \textcircled{12} \quad -4y &= -x - 2 \\ y &= \frac{-x-2}{-4} = \frac{x+2}{4} = \frac{1}{4}x + \frac{1}{2} \end{aligned}$$

$$\begin{aligned} \textcircled{13} \quad -6y &= 2x \\ y &= \frac{2x}{-6} = -\frac{1}{3}x \end{aligned}$$

$$\begin{aligned} \textcircled{14} \quad 8y - 3x &= -6 \\ 8y &= 3x - 6 \\ y &= \frac{3x-6}{8} \text{ or } \frac{3}{8}x - \frac{3}{4} \end{aligned}$$

$$\begin{aligned} \textcircled{15} \quad 7x &= 2y \\ \frac{7x}{2} &= y \end{aligned}$$