

Solve each equation for the given variable.

$$1. \begin{array}{r} -18 = m + 12 \\ -12 \quad -12 \\ \hline -30 = m \\ \hline \boxed{m = -30} \end{array}$$

$$2. \begin{array}{r} 15 + \frac{g}{6} = -21 \\ -15 \quad -15 \\ \hline \frac{g}{6} = -36 \cdot 6 \\ \hline \boxed{g = -216} \end{array}$$

$$3. \begin{array}{r} 7(h+3) = 6(h-3) \\ 7h+21 = 6h-18 \\ -6h \quad -6h \\ \hline h+21 = -18 \\ -21 \quad -21 \\ \hline \boxed{h = -39} \end{array}$$

$$4. \begin{array}{r} 14 + 3n = 8n - 3(n-4) \\ 14 + 3n = 8n - 3n + 12 \\ 14 + 3n = 5n + 12 \\ -5n \quad -5n \\ \hline 4 - 2n = 12 \\ -4 \quad -4 \\ \hline -2n = 8 \\ \hline \boxed{n = -4} \end{array}$$

$$5. \begin{array}{r} \frac{6}{5} \left(\frac{1}{3}x - 5 + \frac{2}{3} \right) = \left(\frac{1}{6}x + 2 \right) \cdot 6 \\ \frac{6}{5}x - 30 + \frac{12}{5} = \frac{6}{6}x + 12 \\ 2x - 30 + 4 = 1x + 12 \\ 2x - 26 = 1x + 12 \\ -1x \quad -1x \\ \hline 1x - 26 = 12 \\ +26 \quad +26 \\ \hline \boxed{x = 38} \end{array}$$

For each of the following problems (#6-8) list all of the terms and coefficients of each expression.

6. $-5x + 7 - 3y$
 Terms: $-5x, 7, -3y$
 Coeff: $-5, -3$

7. $2y + z - 4 + 3x$
 Terms: $2y, z, -4, 3x$
 Coeff: $2, 1, 3$

8. $5 - (x+2) + 3y$
 $5 - 1x - 2 + 3y$
 $3 - 1x + 3y$
 Terms: $3, -1x, 3y$
 Coeff: $-1, 3$

Solve each equation for the given variable.

$$9. \begin{array}{r} 4k + mn = n - 3 \text{ (for } m) \\ -4k \quad -4k \\ \hline mn = n - 3 - 4k \\ \frac{mn}{n} = \frac{n-3-4k}{n} \\ \hline \boxed{m = 1 - \frac{3}{n} - \frac{4k}{n}} \end{array}$$

$$10. \begin{array}{r} \frac{c}{d} + 2 = \frac{f}{g} \text{ (for } c) \\ -2 \quad -2 \\ \hline \frac{c}{d} = \left(\frac{f}{g} - 2 \right) \cdot d \\ \hline \boxed{c = \frac{fd}{g} - 2d} \end{array}$$

$$11. \begin{array}{r} 3ab - 2bc = 12 \text{ (for } c) \\ -3ab \quad -3ab \\ \hline -2bc = 12 - 3ab \\ -2b \quad -2b \\ \hline \boxed{c = \frac{12 - 3ab}{-2b}} \end{array}$$

$$12. \frac{z}{w} = \frac{x+y}{3} \text{ (for } y)$$

$$13. \begin{array}{r} -3(m-2n) = 5m \text{ (for } m) \\ -3m + 6n = 5m \\ +3m \quad +3m \\ \hline 6n = 8m \\ \frac{6n}{8} = \frac{8m}{8} \\ \hline \boxed{\frac{3}{4}n = m} \end{array}$$

$$14. \begin{array}{r} A = \frac{1}{2}bcd + bc \text{ (for } d) \\ -bc \quad -bc \\ \hline 2 \cdot (A - bc) = \frac{1}{2}bcd \\ \frac{2A - 2bc}{bc} = \frac{bcd}{bc} \\ \hline \boxed{d = \frac{2A - 2bc}{bc} \text{ or } d = \frac{2A}{bc} - 2} \end{array}$$

$$3. \begin{array}{r} \frac{z}{w} = \frac{x+y}{3} \\ \frac{3z}{w} = x+y \\ -x \quad -x \\ \hline \boxed{\frac{3z}{w} = y} \end{array}$$

Solve the following inequalities and compound inequalities. Then graph your solution(s).

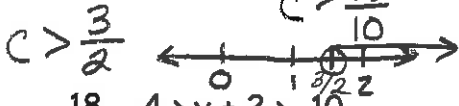
15. $3(4c - 5) - 2c > 0$

$$12c - 15 - 2c > 0$$

$$10c - 15 > 0$$

$$10c > 15$$

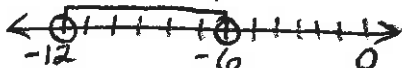
$$c > \frac{15}{10}$$



18. $-4 > y + 2 > -10$

$$\begin{array}{l} -4 > y + 2 \quad \text{and} \quad y + 2 > -10 \\ -2 \quad -2 \quad \quad \quad -2 \quad -2 \end{array}$$

$$\begin{array}{l} -6 > y \quad \text{and} \quad y > -12 \\ -12 < y < -6 \end{array}$$

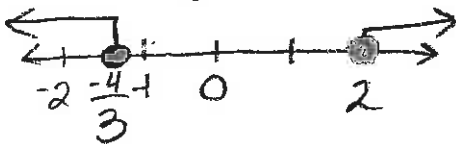


20. $3d + 3 \leq -1$ or $5d + 2 \geq 12$

$$\begin{array}{l} -3 \quad -3 \quad \quad \quad -2 \quad -2 \end{array}$$

$$3d \leq -4 \quad 5d \geq 10$$

$$d \leq -\frac{4}{3} \quad \text{or} \quad d \geq 2$$



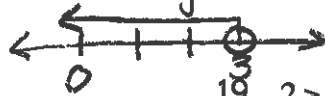
16. $12(j + 1) + 3j < 57$

$$12j + 12 + 3j < 57$$

$$15j + 12 < 57$$

$$15j < 45$$

$$j < 3$$



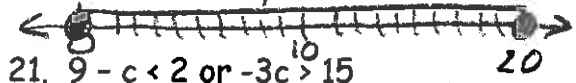
19. $2 \geq \frac{y}{4} - 3 \geq -3$

$$2 \geq \frac{y}{4} - 3 \quad \text{and} \quad \frac{y}{4} - 3 \geq -3$$

$$5 \geq \frac{y}{4} \quad \frac{y}{4} \geq 0$$

$$20 \geq y \quad y \geq 0$$

$$0 \leq y \leq 20$$

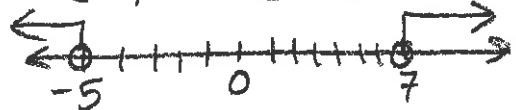


21. $9 - c < 2$ or $-3c > 15$

$$\begin{array}{l} -9 \quad -9 \quad \quad \quad -3 \quad -3 \rightarrow \text{Flip!} \end{array}$$

$$\text{Flip!} \quad \begin{array}{l} -c < -7 \quad c < -5 \\ c > 7 \end{array}$$

$$c > 7 \quad \text{or} \quad c < -5$$



Write an algebraic equation or inequality to represent each situation. Then answer the questions.

22. Jennifer is saving money to buy a bike. The bike costs \$245. She has \$125 saved and each week she adds \$15 to her savings. How long will it take her to save enough money to buy the bike?

Let x = number of weeks

$$125 + 15x = 245$$

$$15x = 120$$

$$x = 8 \quad \boxed{8 \text{ weeks}}$$

23. During a baseball season, Peter hit the difference of the number of home runs Brad hit and 6. Together, they hit a total of 18 home runs. How many home runs did each player hit that season? Let b = Brad's homeruns

$$b - 6 = \text{Peter's "}$$

$$b + b - 6 = 18$$

$$2b = 24$$

$$b = 12$$

Brad hit 12
Peter hit 6

24. The area of the triangle shown is no more than 10 square inches. What is the maximum height of the triangle? ($A = \frac{1}{2}bh$)

$$\frac{1}{2}(4)(2x - 3) \leq 10$$

$$2(2x - 3) \leq 10$$

$$4x - 6 \leq 10$$

$$4x \leq 16$$

$$x \leq 4$$

$$\text{Max height: } 2(4) - 3$$

$$8 - 3$$

$$\boxed{\text{maxht} = 5 \text{ in}}$$

