

Solve each equation for the given variable.

$$1. -18 = m + 12$$

$$\begin{array}{r} -12 \\ -12 \end{array}$$

$$-30 = m$$

$$\boxed{m = -30}$$

$$2. 15 + \frac{g}{6} = -21$$

$$\begin{array}{r} -15 \\ -15 \end{array}$$

$$\cancel{6} \cdot \frac{g}{\cancel{6}} = -36 \cdot 6$$

$$\boxed{g = -216}$$

$$3. 7(h+3) = 6(h-3)$$

$$7h + 21 = 6h - 18$$

$$\begin{array}{r} -6h \\ -6h \end{array}$$

$$h + 21 = -18$$

$$\begin{array}{r} -21 \\ -21 \end{array}$$

$$\boxed{h = -39}$$

$$4. 14 + 3n = 8n - 3(n - 4)$$

$$14 + 3n = 8n - 3n + 12$$

$$14 + 3n = 5n + 12$$

$$\begin{array}{r} -5n \\ -5n \end{array}$$

$$4 - 2n = 12$$

$$\begin{array}{r} -14 \\ -14 \end{array}$$

$$-2n = 8$$

$$\boxed{n = -4}$$

$$5. \left(\frac{1}{3}x - 5 + \frac{2}{3}\right) = \left(\frac{1}{6}x + 2\right) \cdot 6$$

$$\frac{6}{3}x - 30 + \frac{12}{3} = \frac{6}{6}x + 12$$

$$2x - 30 + 4 = 1x + 12$$

$$2x - 26 = 1x + 12$$

$$\begin{array}{r} -1x \\ -1x \end{array}$$

$$1x - 26 = 12$$

$$\begin{array}{r} +26 \\ +26 \end{array}$$

$$\boxed{x = 38}$$

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.

$$9. 4k + mn = n - 3 \text{ (for } m)$$

$$\begin{array}{r} -4k \\ -4k \end{array}$$

$$\frac{mn}{n} = \frac{n-3-4k}{n}$$

$$\boxed{m = 1 - \frac{3}{n} - \frac{4k}{n}}$$

$$10. \frac{c}{d} + 2 = \frac{f}{g} \text{ (for } c)$$

$$\begin{array}{r} -2 \\ -2 \end{array}$$

$$\cancel{d} \cdot \frac{c}{\cancel{d}} = \left(\frac{f}{g} - 2\right) \cdot d$$

$$\boxed{c = \frac{fd}{g} - 2d}$$

$$11. 3ab - 2bc = 12 \text{ (for } c)$$

$$\begin{array}{r} -3ab \\ -3ab \end{array}$$

$$\begin{array}{r} -2bc \\ -2bc \end{array}$$

$$-2bc = 12 - 3ab$$

$$\begin{array}{r} -2b \\ -2b \end{array}$$

$$\boxed{c = \frac{12 - 3ab}{-2b}}$$

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

$$3. \frac{z}{w} = \frac{x+y}{3}$$

$$\begin{array}{r} 3z \\ 3z \end{array}$$

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

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

$$\boxed{\frac{3z}{w} - x = y}$$

$$13. -3(m - 2n) = 5m \text{ (for } m)$$

$$\begin{array}{r} -3m + 6n \\ -3m + 3m \end{array}$$

$$6n = 8m$$

$$\frac{6n}{8} = \frac{8m}{8}$$

$$\boxed{\frac{3}{4}n = m}$$

$$14. A = \frac{1}{2}bcd + bc \text{ (for } d)$$

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

$$2 \cdot (A - bc) = \frac{1}{2}bcd$$

$$\frac{2A - 2bc}{bc} = \frac{bcd}{bc}$$

$$\boxed{d = \frac{2A - 2bc}{bc} \text{ or } d = \frac{2A}{bc} - 2}$$

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

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

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

$$10c - 15 > 0$$

$$10c > 15$$

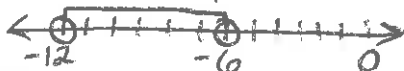
$$c > \frac{15}{10}$$



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

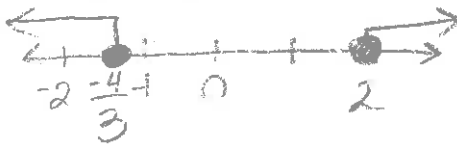
$$\begin{matrix} -4 > y + 2 & \text{and} & y + 2 > -10 \\ -2 & & -2 & -2 \end{matrix}$$

$$\begin{matrix} -6 > y & \text{and} & y > -12 \\ -12 < y < -6 \end{matrix}$$



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

$$\begin{matrix} 3d \leq -4 & 5d \geq 10 \\ d \leq -\frac{4}{3} & \text{or} & d \geq 2 \end{matrix}$$



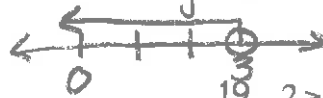
16. $12(j + 1) + 3j < 57$

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

$$15j + 12 < 57$$

$$15j < 45$$

$$j < 3$$



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

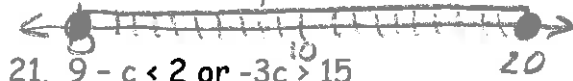
$$2 \geq \frac{y}{4} - 3 \quad \text{and} \quad \frac{y}{4} - 3 \geq -3$$

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

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

$$20 \geq y$$

$$0 \leq y \leq 20$$

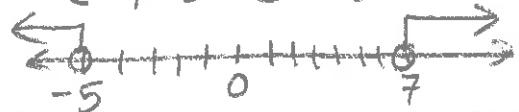


21. $9 - c < 2$ or $-3c > 15$

$$\begin{matrix} -9 & -9 & -3 & -3 \end{matrix} \rightarrow \text{Flip!}$$

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

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



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. ^{sum} 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? ($A = \frac{1}{2}bh$)

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

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

$$4x - 6 \leq 10$$

$$4x \leq 16$$

$$x \leq 4$$

Max height: $2(4) - 3$

$$8 - 3$$

maxht = 5 in

