

# Solving Linear Equations Study Guide

① ~~A~~  $\frac{1}{3}(6r+12) = 2r+12$

$$\frac{1}{3}(6r) + \frac{1}{3}(12) = 2r+12$$

$$2r+4 = 2r+12$$

$$2r+4-2r = 2r+12-2r$$

$$4 \neq 12$$

no solution

② ~~B~~  $\frac{1}{4}(8r+12) = 3+2r$

$$\frac{1}{4}(8r) + \frac{1}{4}(12) = 3r+2r$$

same equations  $\rightarrow 2r+3 = 3+2r$

$$2r+3-2r = 3+2r-2r$$

$$3 = 3$$

Identity Equation

Infinitely many solutions

③ ~~e~~  $\frac{1}{2}(16+12r) = 12r+8$

$$\frac{1}{2}(16) + \frac{1}{2}(12r) = 12r+8$$

$$8+6r = 12r+8$$

$$8+6r-12r = 12r+8-12r$$

$$8-6r = 8$$

$$8-6r-8 = 8-8$$

$$-6r = 0$$

$$\frac{-6r}{-6} = \frac{0}{-6}$$

$$-6 \mid -6$$

$$r = 0$$

One solution

④ ~~f~~  $\frac{1}{5}(10r+20) = 2r+10$

$$\frac{1}{5}(10r) + \frac{1}{5}(20) = 2r+10$$

$$2r+4 = 2r+10$$

$$2r+4-2r = 2r+10-2r$$

$$4 \neq 10$$

no solution

**B has infinitely many solutions**

② Perimeter = 28



$(2+x)$  ft

$$3 + 3 + (2+x) + (2+x) = 28$$

$$3+3+2+2+x+x = 28$$

$$10+2x = 28$$

$$10+2x-10 = 28-10$$

$$2x = 18$$

$$\frac{2x=18}{2} = \frac{18}{2}$$

B.  $x=9$

$$\begin{array}{r} \textcircled{3} \quad 3y + 5 = 7 + 3y - 9 \\ 3y + 5 = 3y - 2 \\ 3y + 5 - 3y = 3y - 2 - 3y \\ 5 = -2 \end{array}$$

\* Combine like terms on same side

D No Solutions

$$\begin{array}{r} \textcircled{4} \quad 100 \text{ minutes} + \text{additional minutes over } 100 = \text{Total Cost} \\ \$24 + 0.07x = \$26.38 \\ * x = \text{additional minutes over } 100 \end{array}$$

$$\begin{array}{r} 24 + 0.07x = 26.38 \\ 24 + 0.07x - 24 = 26.38 - 24 \\ 0.07x = 2.38 \\ \frac{0.07x}{0.07} = \frac{2.38}{0.07} \\ x = 34 \end{array}$$

How many total minutes of long distance did Todd use in October?

$$100 + 34 = 134$$

C

$$\begin{array}{r} \textcircled{5} \quad -(5-x) = 5-x \\ -1(5) - 1(-x) = 5-x \\ -5 + x = 5-x \end{array}$$

B

$$\textcircled{6} \quad 8 - \frac{6}{5}x = 10$$

$$8 - \frac{6}{5}x - 8 = 10 - 8$$

$$-\frac{6}{5}x = 2$$

$$\frac{-5}{6} \cdot \frac{-6}{5}x = 2 \cdot \frac{-5}{6}$$

$$x = \frac{-10 \div 2}{6 \div 2} = \frac{-5}{3} \quad \textcircled{B}$$

$$\textcircled{7} \quad 5(x+1) - 8 = x - 4(2x-1)$$

$$5(x) + 5(1) - 8 = x - 4(2x) - 4(-1)$$

$$5x + 5 - 8 = x - 8x + 4$$

$$5x - 3 = -7x + 4$$

$$5x - 3 + 7x = -7x + 4 + 7x$$

$$12x - 3 = 4$$

$$12x - 3 + 3 = 4 + 3$$

$$12x = 7$$

$$\frac{12x}{12} = \frac{7}{12}$$

$$x = \frac{7}{12} \quad \textcircled{B}$$

$$\textcircled{8} \quad 2m = 6m - 32$$

$$2m - 6m = 6m - 32 - 6m$$

$$-4m = -32$$

$$\frac{-4m}{-4} = \frac{-32}{-4}$$

$$-4 \quad | \quad -4$$

$$m = 8$$

$$\textcircled{D}$$