

6.2: Solving Equations by Using Balance Strategies - Worksheet

1. Solve each equation and verify the solution.

a) $3y - 6 = 9y$

$$\begin{array}{r} -9y \\ -9y \end{array}$$

$$\begin{array}{r} -6y - 6 = 0 \\ +6 \quad +6 \end{array}$$

$$\begin{array}{r} -6y = 6 \\ -6 \quad -6 \end{array}$$

$$y = -1$$

b) $2a - 4 = -3a$

$$\begin{array}{r} +3a \\ +3a \end{array}$$

$$\begin{array}{r} 5a - 4 = 0 \\ +4 \quad +4 \end{array}$$

$$\frac{5a}{5} = \frac{4}{5}$$

$$a = \frac{4}{5} = 0.8$$

c) $-14.3 + 2c = -c + 4.9$

$$\begin{array}{r} +c \quad +c \end{array}$$

$$\begin{array}{r} -14.3 + 3c = 4.9 \\ +14.3 \quad +14.3 \end{array}$$

$$\frac{3c}{3} = \frac{19.2}{3}$$

$$c = 6.4$$

d) $-12.6f = 6.1f + 74.8$

$$\begin{array}{r} -6.1f \quad -6.1f \end{array}$$

$$\begin{array}{r} -18.7f = 74.8 \\ -18.7 \quad -18.7 \end{array}$$

$$f = -4$$

e) $\frac{22.75}{w} = \frac{-3.5}{51}$

$$\begin{array}{r} -3.5w = 22.75 \\ -3.5 \quad -3.5 \end{array}$$

$$w = -6.5$$

f) $\frac{1}{2}x + \frac{3}{4} = \frac{5}{8}x - \frac{1}{4}$

$$\begin{array}{r} \times 4 \quad \times 2 \quad \times 2 \quad \times 2 \end{array}$$

$$\frac{4}{8}x + \frac{6}{8} = \frac{5}{8}x - \frac{2}{8}$$

$$\begin{array}{r} 4x + 6 = 5x - 2 \\ -5x \quad -5x \end{array}$$

$$\begin{array}{r} -1x + 6 = -2 \\ -6 \quad -6 \end{array}$$

$$\frac{-1x}{-1} = \frac{-8}{-1} \quad x = 8$$

+

turn around

2. The sum of three times a number, plus five is equal to seven less than seven times the number. Write an equation to model this situation. Solve the equation to determine the number. Verify the solution.

$$\begin{array}{r} 3n + 5 = 7n - 7 \\ -7n \quad -7n \end{array}$$

$$\begin{array}{r} -4n + 5 = -7 \\ -5 \quad -5 \end{array}$$

$$\frac{-4n}{-4} = \frac{-12}{-4} \quad \boxed{n=3}$$

3. Solve each equation and verify the solution.

a) $2(h-1) = -3(h+3)$

$$\begin{array}{r} 2h - 2 = -3h - 9 \\ +3h \quad +3h \end{array}$$

$$\begin{array}{r} 5h - 2 = -9 \\ +2 \quad +2 \end{array}$$

$$\frac{5h}{5} = \frac{-7}{5}$$

$$\boxed{h = -1.4}$$

b) $4.1(2-y) = -1.025(y-0.5)$

$$\begin{array}{r} 8.2 - 4.1y = -1.025y + 0.5125 \\ +1.025y \quad +1.025y \end{array}$$

$$\begin{array}{r} 8.2 - 3.075y = 0.5125 \\ -8.2 \quad -8.2 \end{array}$$

$$\begin{array}{r} -3.075y = -7.6875 \\ -3.075 \quad -3.075 \end{array}$$

$$\boxed{y = 2.5}$$

$$c) \quad \frac{3}{4} \left(\frac{2x-3}{1} \right) = \frac{6}{5} \left(\frac{3x+1}{1} \right)$$

$$\frac{6x}{4} - \frac{9}{4} = \frac{18x}{5} + \frac{6}{5}$$

$$\frac{30x}{20} - \frac{45}{20} = \frac{72x}{20} + \frac{24}{20}$$

$$30x - 45 = 72x + 24$$

$$-72x \quad -72x$$

$$-42x - 45 = 24$$

$$+45 \quad +45$$

$$\frac{-42x}{-42} = \frac{69}{-42}$$

$$x = -\frac{23}{14}$$

$$d) \quad \frac{2b}{3} + \frac{11}{4} = \frac{3}{1} - \frac{11b}{6}$$

$$\frac{8b}{12} + \frac{33}{12} = \frac{36}{12} - \frac{22b}{12}$$

$$8b + 33 = 36 - 22b$$

$$+22b \quad +22b$$

$$30b + 33 = 36$$

$$-33 \quad -33$$

$$\frac{30b}{30} = \frac{3}{30}$$

$$b = 0.1$$