

Instructions: Show all work. State whether each solution is conditional, an identity or a contradiction. Be sure to state the solution, if one exists, or state no solution.

1. Solve the following equations.

a. $\frac{4x-9}{3} + \frac{x}{6} = \frac{x}{2} - 2$ LCD = 6

$$2(4x-9) + \frac{x}{2} = \frac{3x}{2} - 6 \cdot 2$$

$$2(4x-9) + x = 3x - 12$$

$$8x - 18 + x = 3x - 12$$

$$9x - 18 = 3x - 12$$

$$\begin{array}{r} 9x - 18 = 3x - 12 \\ -3x \qquad -3x \\ \hline \end{array}$$

$$\begin{array}{r} 6x - 18 = -12 \\ +18 \quad +18 \\ \hline \end{array}$$

$$6x = 6$$

$$\frac{1x}{1} = \frac{1}{1}$$

$$\boxed{x = 1}$$

Check

$$\frac{4(1)-9}{3} + \frac{1}{6} = -\frac{5}{3} + \frac{1}{6} = -\frac{3}{2}$$

$$\frac{1}{2} - 2 = -\frac{3}{2} \quad \checkmark$$

both sides agree!

conditional

b. $9b - 4(b+1) = 8b - (3b+2)$

$$9b - 4b - 4 = 8b - 3b - 2$$

$$5b - 4 = 5b - 2$$

$$\begin{array}{r} 5b - 4 = 5b - 2 \\ -5b \qquad -5b \\ \hline \end{array}$$

$$-4 = -2$$

contradiction x has no solutions

c. $-2x + 5x = 4(x-2) - (x-8)$

$$3x = 4x - 8 - x + 8$$

$$3x = 3x$$

identity

x is any real number