

Instructions: Show all work. Give exact answers (improper fractions) and do not round unless specifically asked to do so. If you work the problem in your calculator you can write keystrokes to show work for partial credit.

1. Solve the equations for the variable. State whether the equation is conditional, an identity or a contradiction, and clearly state the solution (if any) or say that there is no solution.
- a. $3x - (2x - 7) + 5 = -5x + 3(2x + 4) - 1$

$$3x - 2x + 7 + 5 = -5x + 6x + 12 - 1$$

$$x + 12 = x + 11$$

$$12 = 11 \quad \text{Contradiction}$$

no solution

b. $\frac{4}{3}x + \frac{x-2}{2} = \frac{x-1}{6}$

$$2 \cdot \frac{4}{3}x + \frac{3}{2}(x-2) = \frac{x-1}{6}$$

$$8x + 3(x-2) = x-1$$

$$8x + 3x - 6 = x - 1$$

$$11x - 6 = x - 1$$

$$10x = 5$$

$$x = \frac{5}{10} = \frac{1}{2}$$

Conditional

2. What is the difference between "simplifying an expression" and "solving an equation"? Are there some things you can do in one of these that you cannot do in the other? (10 points)

Simplifying an expression means combining like terms, reducing, etc. and typically there is no equal sign.

Solving involves having an equal sign. Simplifying is involved but then steps are taken to isolate the variable to find the value or values that make the equation true.