Review: Solving Equations

equation:

$$2x + 1 = 7$$

the value 3 makes this equation true

so the solution set for this equation
is {3}

example: $x^2 = 9$ has solution set {-3, 3}

how to solve equations:

$$2x + 1 = 7$$

$$2x + 1 - 1 = 7 - 1 \qquad \leftarrow \text{adding/subtracting the same thing from } \underline{\underline{both}} \text{ sides does not change the solution set}$$

$$\frac{2x}{2} = \frac{6}{2} \qquad \leftarrow \text{multiplying/dividing } \underline{\underline{both}} \text{ sides by the same } \underline{\text{non-zero}} \text{ number does not change the solution set}$$

$$x = 3$$

examples: #20

method #1:   method #2:

method #1:

$$-5x + 4 = -9 - 4x$$

$$-5x + 4x^{+4} = -9 - 4x + 4x$$

$$-x + 4 = -9$$

$$-x + 4 - 4 = -9 - 4$$

$$-x = -13$$

$$x = 13$$

method #2:

$$-5x + 4 = -9 - 4x$$

$$-5x + 5x + 4 = -9 - 4x + 5x$$

$$4 = -9 + x$$

$$13 = x$$

$$x = 13$$

#40:

$$20\left(\frac{1}{4} + \frac{1}{5}\right) = \left(\frac{x}{2}\right) \cdot 20$$

$$5 + 4 = 10x$$

$$9 = 10x$$

$$x = \frac{9}{10} \quad \text{or} \quad 0.9$$

#46

$$15\left(\frac{x}{3} - \frac{x-5}{5}\right) = 3 \cdot 15$$

$$5x - 3(x-5) = 45$$

$$5x - 3x + 15 = 45$$

$$2x = 30$$

$$x = 15$$

$$-3(x-5)$$

$$-3x - 3(-5)$$