Review: Solving Equations

equation:

$$2x + 1 = 7$$

the value 3 make the equation true

so the solution for this equation is $x = 3$

note: this is sometimes called
the solution set

and can be written as $\{3\}$

further note: $x^2 = 9$ has solutions

$$x = 3, -3 \qquad (x = \pm 3)$$

$$\{-3, 3\}$$

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how to solve equations:

$$2x + 1 = 7$$

$$2x + 1 - 1 = 7 - 1 \qquad \Leftarrow \text{ adding or subtracting}$$
$$\text{the same thing from}$$

$$\frac{2x}{2} = \frac{6}{2} \quad \Leftarrow \text{ multiplying / dividing } \underline{\text{both sides}}$$

$$x = 3$$

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

method #1

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

$$-5x = -13 - 4x$$

$$-5x + 4x = -13 - 4x + 4x$$

$$-x = -13$$

$$\boxed{x = 13}$$

method #2:

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

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

$$13 = x$$

$$\boxed{x = 13}$$

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

$$5 + 4 = 10x$$

$$9 = 10x$$

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

#46:

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

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

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

$$2x = 30$$

$$x = 15$$