

## Solving Simple Algebraic Equations

Four step Process:

1. Move all variable terms to the left of the equal sign.
2. Move all constants to the right of the equal sign.
3. Combine like terms.
4. Divide both sides by the multiplier.

### Example

Solve the following equations for x.

$$a) x + 3 = 7$$

$$x = 7 - 3$$

$$x = 4$$

$$b) 2x - 3 = 5$$

$$2x = 5 + 3$$

$$\frac{2x}{2} = \frac{8}{2}$$

$$x = 4$$

$$c) -x + 2 = 5$$

$$-x = 5 - 2$$

$$\frac{-x}{-1} = \frac{3}{-1}$$

$$x = -3$$

$$d) 3x - 1 = 2x + 4$$

$$3x - 2x = 4 + 1$$

$$x = 5$$

$$e) 5x + 7 = 2x - 2$$

$$5x - 2x = -2 - 7$$

$$\frac{3x}{3} = \frac{-9}{3}$$

$$x = -3$$

$$f) 10x = 2x - 24$$

$$10x - 2x = -24$$

$$\frac{8x}{8} = \frac{-24}{8}$$

$$x = -3$$

## Cross Multiplication

Cross multiplication is used to solve equations that have a single fraction on each side of the equal sign.

### Example

Solve each equation for x.

$$a) \frac{x}{3} = \frac{3}{18}$$

$$\frac{18x}{18} = \frac{9}{18}$$
$$x = \frac{1}{2}$$

$$b) \frac{x}{9} = \frac{2}{3}$$

$$\frac{3x}{3} = \frac{18}{3}$$
$$x = 6$$

$$c) \frac{2}{x} = \frac{8}{16}$$

$$\frac{8x}{8} = \frac{32}{8}$$
$$x = 4$$

$$d) \frac{3}{x} = -\frac{4}{12}$$

$$\frac{3}{x} = \frac{-4}{12}$$
$$\frac{-4x}{-4} = \frac{36}{-4}$$
$$x = -9$$

$$e) \frac{x}{5} = \frac{5}{1}$$

$$x = 25$$

$$f) -\frac{2}{3} = -\frac{x}{18}$$

$$\frac{-2}{3} = \frac{-x}{18}$$
$$\frac{-3x}{-3} = \frac{-36}{-3}$$
$$x = 12$$

$$\text{or } \frac{2}{-3} = \frac{-x}{18}$$

$$\frac{3x}{3} = \frac{36}{3}$$

$$x = 12$$