

Solve linear equations in one unknown

An **equation** is a statement with an equal sign, stating that two expressions are equal in value.

A **linear equation** is an equation that contains a variable that is not raised to any power other than 1.

To solve a linear equation in one unknown it is enough to make the variable the subject.

For example:

$$\text{Solve for } x: 2x - 5 = 7$$

$$2x - 5 = 7$$

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

Adding five to both sides.

$$\frac{2x}{2} = \frac{12}{2}$$

Dividing both sides by two.

$$x = 6$$

Example

Solve the following equations:

a) $5x + 11 = 0$

b) $3(2x + 1) = 5$

a) $5x + 11 = 0$

$$5x + 11 - 11 = 0 - 11$$

$$5x = -11$$

$$\frac{5x}{5} = \frac{-11}{5}$$

$$x = \frac{-11}{5}$$

b) $3(2x + 1) = 5$

$$6x + 3 = 5$$

$$6x + 3 - 3 = 5 - 3$$

$$6x = 2$$

$$\frac{6x}{6} = \frac{2}{6}$$

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

Example

Solve the following equations:

a) $3x + 11 = x - 1$

b) $2(x - 1) = 3x + 5$

When the unknown appears on both sides of the equation, remove it from one side. It is better to remove the variable with a smaller coefficient.

a) $3x + 11 = x - 1$

$$3x + 11 - x = x - 1 - x$$

$$2x + 11 = -1$$

$$2x + 11 - 11 = -1 - 11$$

$$2x = -12$$

$$\frac{2x}{2} = \frac{-12}{2}$$

$$x = -6$$

b) $2(x - 1) = 3x + 5$

$$2x - 2 = 3x + 5$$

$$2x - 2 - 2x = 3x + 5 - 2x$$

$$-2 = x + 5$$

$$-2 - 5 = x + 5 - 5$$

$$-7 = x$$

mathematicschapters.com

Solve linear equations in one unknown

mathematicschapters.com