Quadratic equations look like $ax^2 + bx + c = 0$. Because the variable, x, goes as high as the second power, we will expect to get 2 solutions for x (although we may get the same answer twice – a double root).

Example 1

Solve $x^2 + 12x + 20 = 0$

Step 1- Get all the x^2, x, & non-zero numbers on one side of the equal sign and get 0 on the other side of the equal sign. Make sure the coefficient of x^2 is positive.

Our equation is already like this. We can go on to Step 2.

Step 2- Factor

$$x^2 + 12x + 20 = 0$$
$$(x + 10)(x + 2) = 0$$

Step 3- Set each factor equal to 0 and solve for x.

$x + 10 = 0$
$\boldsymbol{x = -10}$

$x + 2 = 0$
$\boldsymbol{x = -2}$

Step 4- Write the solution

$$\boldsymbol{x = -2, -10}$$

Example 2

Solve $25x^2 - 10x = 0$

Step 1- Get all the x^2, x, & non-zero numbers on one side of the equal sign and get 0 on the other side of the equal sign. Make sure the coefficient of x^2 is positive.

Our equation is already like this. We can go on to Step 2.

Step 2- Factor

$$25x^2 - 10x = 0$$
$$5x(5x - 2) = 0$$

Step 3- Set each factor equal to 0 and solve for x.

$$5x = 0$$
$$\boldsymbol{x = 0}$$

$$5x - 2 = 0$$
$$5x = 2$$
$$\boldsymbol{x = \frac{2}{5}}$$

Step 4- Write the solution

$$\boldsymbol{x = 0, \frac{2}{5}}$$

Example 3

Solve $10x + 3 = -3x^2$

Step 1- Get all the x^2, x, & non-zero numbers on one side of the equal sign and get 0 on the other side of the equal sign. Make sure the coefficient of x^2 is positive.

$$10x + 3 = -3x^2$$
$$3x^2 + 10x + 3 = 0$$

Step 2- Factor

$$3x^2 + 10x + 3 = 0$$
$$(3x + 1)(x + 3) = 0$$

Step 3- Set each factor equal to 0 and solve for x.

$$3x + 1 = 0$$
$$3x = -1$$
$$\boldsymbol{x = -\frac{1}{3}}$$

$$x + 3 = 0$$
$$\boldsymbol{x = -3}$$

Step 4- Write the solution

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