

Year 9 Spring 2

KEYWORDS:

Plotting To place a point on a coordinate plane by using X and Y coordinates.

Coefficient A number used to multiply a variable. Example: 6z means 6 times z, and "z" is a variable, so 6 is a coefficient.

Negative Coefficient A negative number used to multiply a variable.

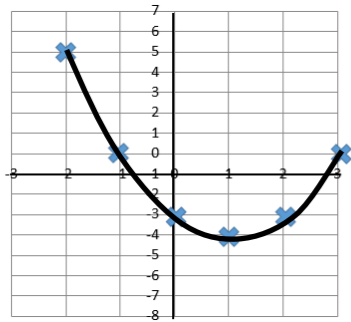
Factorising The reverse of expanding brackets, by taking out any common factors which the terms have

Solving Finding the value of the variable (x) that makes the equation true.

Roots of Quadratics The solution to the equation and the point(s) at which the line crosses the x axis.

Plotting Quadratics $y = x^2 - 2x - 3$

x	-2	-1	0	1	2	3
x^2	+4	+1	0	+1	+4	+9
$-2x$	+4	+2	0	-2	-4	-6
-3	-3	-3	-3	-3	-3	-3
y	5	0	-3	-4	-3	0



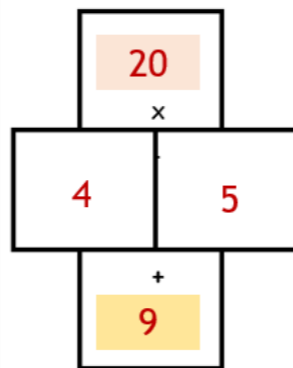
- (-2,5)
- (-1,0)
- (0,-3)
- (1,-4)
- (2,-3)
- (3,0)

Video 251

Solving by Factorising

Factorise and solve : $x^2 + 9x + 20 = 0$

What does **factorise** mean? (x) (x)



What should the **product** (x) of the 2 numbers be?

What should the **sum** (+) of the 2 numbers be?

$$x^2 + 9x + 20 \equiv (x + 4)(x + 5)$$

$$x = -4, x = -5$$

Videos 230-233

Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Use the quadratic formula to solve $2x^2 + 5x - 1 = 0$

$$2x^2 + 5x - 1 = 0$$

$$a=2 \quad b=5 \quad c=-1$$

$$\frac{-5 \pm \sqrt{5^2 - 4 \times 2 \times -1}}{2 \times 2}$$

Use your calculator to find 2 answers

$$\frac{-5 + \sqrt{33}}{4} \quad \frac{-5 - \sqrt{33}}{4}$$

$$x = 0.1862 \text{ or}$$

$$x = -2.6861$$

Videos 241-242

Roots of Quadratics

$$y = x^2 - 6x + 5$$

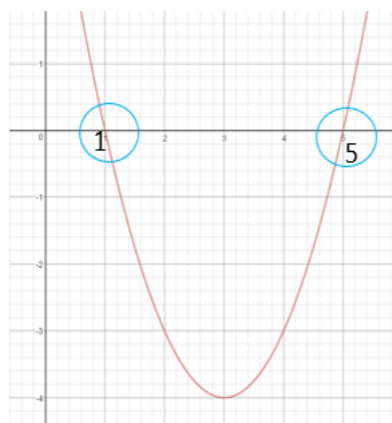
When factorised becomes;

$$y = (x - 1)(x - 5)$$

The points where the graph crosses the x-axis are called the **roots of the equation**

The roots for this equation occur when $y = 0$

In this case the roots are $x = 1$ and $x = 5$
(as roots are opposite signs to brackets for example; $x-1=0$, so x must be 1)



Video 253

Completing the Square

Use completing the square to solve $x^2 + 4x - 12 = 0$

1) This number will be half the coefficient of x

$$(x+2)^2 - 2^2 - 12 = 0$$

$$(x+2)^2 - 4 - 12 = 0$$

$$(x+2)^2 - 16 = 0$$

2) Subtract the number in the brackets squared

3) Square root both sides

$$(x+2)^2 = 16$$

$$x+2 = \pm \sqrt{16}$$

$$x = \pm 4 - 2$$

$$x = 2 \text{ or } x = -6$$

4) Don't forget there will be a positive and negative answer here

Videos 238-239

