

Expand linear brackets

To expand a bracket, multiply each term in the bracket by the expression outside the bracket.

Eg. $3(m + 7) = 3m + 21$

Expand double brackets

Multiply each term in the first bracket by the terms in the second bracket. Use either FOIL or the grid method.

Eg. Expand $(x+3)(x+2)$

(Multiply first, outside, inside, last for FOIL method)

$$= x^2 + 2x + 3x + 6$$

(Then simplify)

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

Factorising quadratic expressions

When a quadratic expression is in the form $ax^2 + bx + c = 0$ find the two numbers that add to give b and multiply to give c .

$$x^2 + 7x + 10 = (x + 5)(x + 2)$$

(because 5 and 2 add to give 7 and multiply to give 10)

$$x^2 + 2x - 8 = (x + 4)(x - 2)$$

(because +4 and -2 add to give +2 and multiply to give -8)



Year 10 foundation topic 16

Quadratic equations and graphs

What careers would use these skills?

Engineers, architects, economists, dieticians, paramedics, air traffic controllers, computer analysts, carpenters

Factorise linear expressions

The reverse of expanding. Factorising is writing an expression as a product of terms by 'taking out' a common factor.

$$\text{Eg. } 6x - 15 = 3(2x - 5)$$

Where 3 is the highest common factor of both the $6x$ and 15.

Expand square brackets

When a bracket is squared, you multiply the bracket by itself.

$$\text{Eg. Expand } (x + 3)^2$$

$$= (x + 3)(x + 3)$$

$$= x^2 + 3x + 3x + 9$$

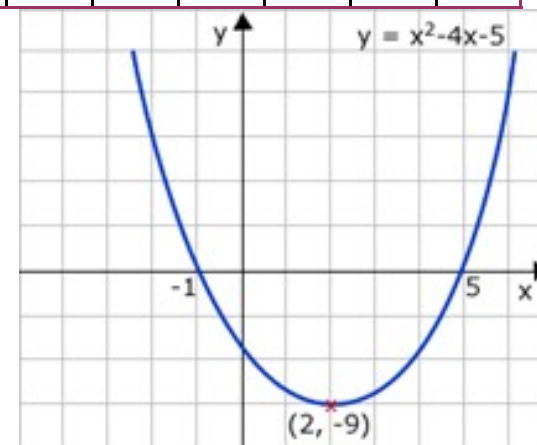
$$= x^2 + 6x + 9$$

Plot quadratic graphs

x	-2	-1	0	1	2	3	4	5	6
y		0			-9			0	

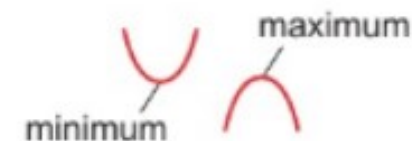
Plot $y = x^2 - 4x - 5$

1. Substitute the x values into the equation
2. Plot the point
3. Join them with a smooth curve



Solve problems using quadratic graphs

You might be asked to give the maximum or minimum point, this is the highest or lowest coordinate on the graph.



Eg. For the graph above, the minimum point is $(2, -9)$

The roots of a quadratic are the x values of when the graph crosses the x axis.

Eg. For the graph above, the roots are -1 and 5 .