

# Quadratic and cubic graphs

An equation with an  $x^2$  term is a QUADRATIC.

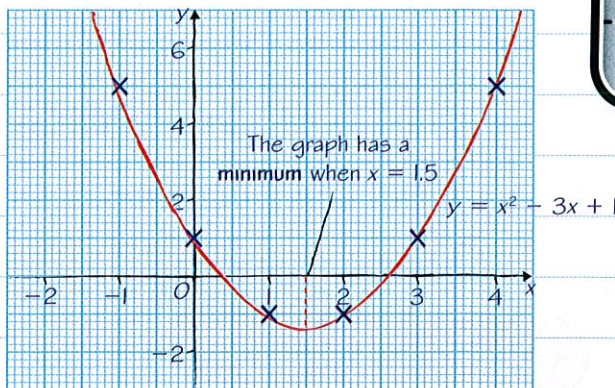
An equation with an  $x^3$  term is a CUBIC.

You can use a table of values to draw graphs of quadratic and cubic equations.

$$y = x^2 - 3x + 1$$

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

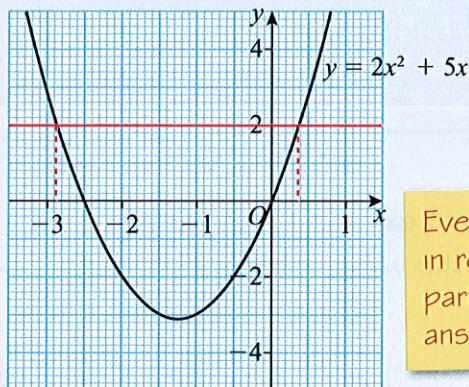
All quadratic graphs have a line of symmetry which passes through the minimum or maximum point.



The graph of  $y = x^2 - 3x + 1$  is symmetrical about the line  $x = 1.5$

## Worked example

This is a graph of  $y = 2x^2 + 5x$



Everything in red is part of the answer.

By drawing a suitable straight line on the graph, solve the equation  $2x^2 + 5x - 2 = 0$

Give your answers correct to 1 decimal place.

$$2x^2 + 5x - 2 = 0 \quad (+ 2)$$

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

$$x = 0.4, x = -2.9$$

grade B

You can solve the quadratic equation  $2x^2 + 5x - 2 = 0$  by finding where the graph  $y = 2x^2 + 5x$  crosses the straight line  $y = 2$ .

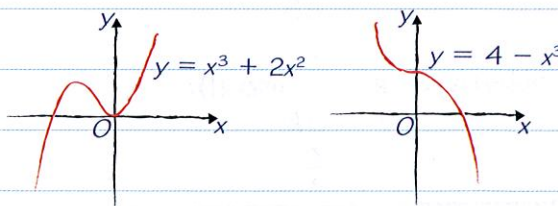
Draw the line  $y = 2$  on the graph.

The solutions are the  $x$ -values at the points of intersection.

You can revise solving a similar pair of equations algebraically on page 42.

## Cubic graphs

You need to know the general shape of a cubic graph if you're going for a grade A.



## Now try this

grade B

edexcel

(a) Complete the table of values for  $y = 2x^2 - 4x$

x	-2	-1	0	1	2	3
y	16		0			6

(2 marks)

(b) On a grid with  $-2 \leq x \leq 3$  and  $-5 \leq y \leq 20$ , draw the graph of  $y = 2x^2 - 4x$  for values of  $x$  from  $-2$  to  $3$  (2 marks)

(c) Write down the values of  $x$  for which  $2x^2 - 4x - 3 = 0$  (2 marks)