

## What do I need to be able to do?

By the end of this unit you should be able to:

- Draw quadratic graphs
- Interpret quadratic graphs
- Interpret other graphs including reciprocals
- Represent inequalities

## Keywords

**Quadratic:** a curved graph with the highest power being 2. Square power.

**Inequality:** makes a non equal comparison between two numbers

**Reciprocal:** a reciprocal is 1 divided by the number

**Cubic:** a curved graph with the highest power being 3. Cubic power.

**Origin:** the coordinate (0, 0)

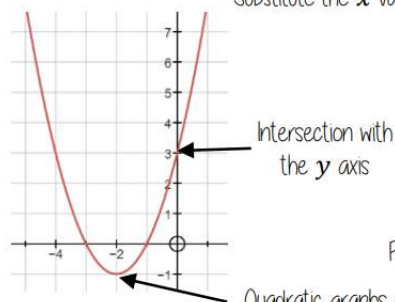
**Parabola:** a 'u' shaped curve that has mirror symmetry

## Quadratic Graphs

$$y = x^2 + 4x + 3$$

If  $x^2$  is the highest power in your equation then you have a quadratic graph

It will have a parabola shape



Substitute the  $x$  values into the equation of your line to find the  $y$  coordinates

$x$	-4	-3	-2	-1	0	1
$y$	3	0	-1	0	3	8

Coordinate pairs for plotting (-3, 0)

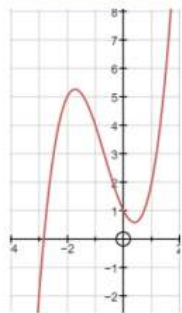
Plot all of the coordinate pairs and join the points with a curve (freehand)

Quadratic graphs are always symmetrical with the turning point in the middle

## Interpret other graphs

Cubic Graphs

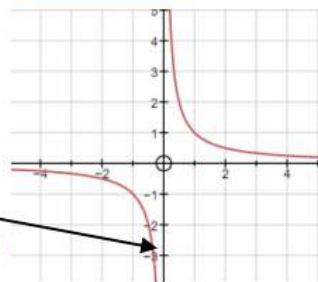
$$y = x^3 + 2x^2 - 2x + 1$$



If  $x^3$  is the highest power in your equation then you have a cubic graph

Reciprocal Graphs

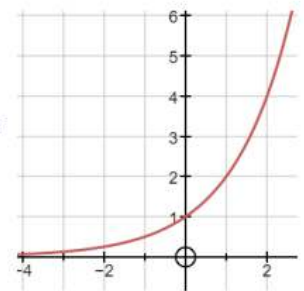
$$y = \frac{1}{x}$$



Reciprocal graphs never touch the  $y$  axis  
This is because  $x$  cannot be 0  
This is an asymptote

Exponential Graphs

$$y = 2^x$$



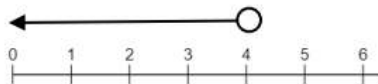
Exponential graphs have a power of  $x$

## Represent Inequalities

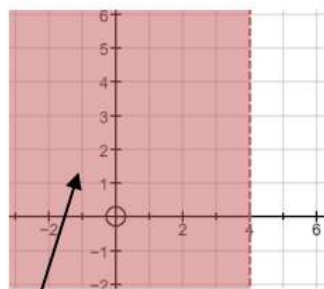
Multiple methods of representing inequalities

$$x < 4$$

All values are less than 4



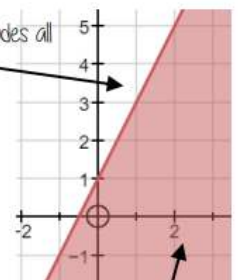
The shaded area indicates all possible values of  $x$



The dotted line shows that the inequality does not include these points

The solid line shows that the inequality includes all the points on this line

$$y \geq 2x + 1$$



The shaded area indicates all possible solutions to this inequality