

YEAR 9 — REPRESENTATIONS...

Algebraic Representation

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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)

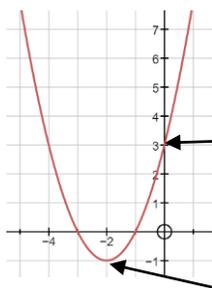
Parabola: a 'u' shaped curve that has mirror symmetry

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

Intersection with the y axis

Coordinate pairs for plotting (-3, 0)

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

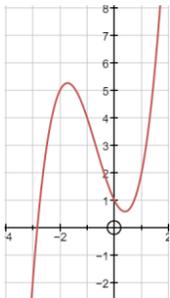
Quadratic graphs are always symmetrical with the turning point in the middle

Interpret other graphs

Cubic Graphs

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

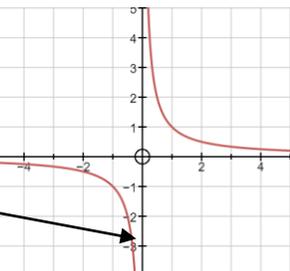
If x^3 is the highest power in your equation then you have a cubic graph



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

Reciprocal Graphs

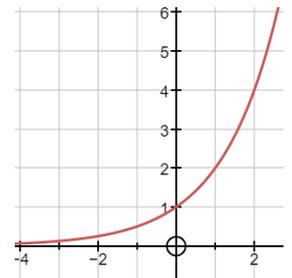
$$y = \frac{1}{x}$$



Exponential Graphs

$$y = 2^x$$

Exponential graphs have a power of x

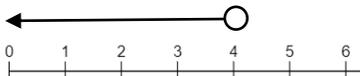


Represent Inequalities

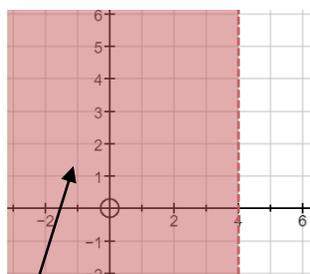
Multiple methods of representing inequalities

$$x < 4$$

All values are less than 4



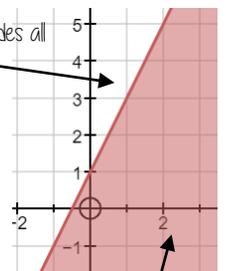
The shaded area indicates all possible values of x



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