

Graphs Of Functions

Quick revision notes [Open it online](#)

Name: _____

Date: _____

At a glance

Linear, quadratic, cubic, reciprocal and exponential graphs: shapes, tables, plotting and key features.

1. Shapes of graphs
2. Tables of values and plotting
3. Key features
4. Reading from a graph

1. Shapes of graphs

☐ I revised this

- Recognise each family from its equation and sketch its shape.

Type	Example	Shape and features
Linear	$y = 2x + 1$	straight line
Quadratic	$y = x^2 - 4$	U if x^2 term positive, $\cap$ if negative; symmetrical
Cubic	$y = x^3 - 3x$	S-shaped; up to two turning points
Reciprocal	$y = 2/x$	two branches; asymptotes $x = 0$ and $y = 0$
Exponential	$y = 2^x$	through $(0, 1)$; asymptote $y = 0$; grows fast

Worked example

Which type is $y = 5 - x^2$, and where is its turning point?

1. Quadratic with a negative x^2 term: $\cap$ -shaped.
2. At $x = 0$, $y = 5$.

$\cap$ -shaped parabola, maximum at $(0, 5)$

2. Tables of values and plotting

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- Use brackets for negatives: $x = -2$ in $x^2 - 3x + 1$ gives $4 + 6 + 1 = 11$.
- Use the calculator's TABLE mode to check every value.
- Plot with small crosses, then draw **one smooth curve** through all points — no straight segments, no joining across an asymptote.

How to do it

1. Complete the table (check with TABLE mode).
2. Plot each point accurately.
3. Draw a smooth curve; extend only as far as the table.

Worked example

For $y = 12/x + x$, find y when $x = 4$ and $x = -2$.

1. $x = 4$: $3 + 4 = 7$.
2. $x = -2$: $-6 + (-2) = -8$.

7 and -8

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- ### Worked example

1. $x = 0: y = -5.$

$$2. x^2 - 4x - 5 = (x - 5)(x + 1) = 0 \rightarrow x = 5 \text{ or } -1.$$

3. Halfway: $x = 2$, $y = 4 - 8 - 5 = -9$.

$(0, -5)$; $(5, 0)$ and $(-1, 0)$; minimum $(2, -9)$

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- ### Worked example

$$1. x(x^2 - 3) = 0.$$

$$2. x = 0 \text{ or } x = \pm\sqrt{3} \approx \pm 1.73.$$

$x = -1.7, 0$ and 1.7

Don't write	Write instead
✗ $(-2)^2$ entered as $-2^2 = -4$	✓ Use brackets: $(-2)^2 = 4$
✗ Joining points with straight lines	✓ Draw one smooth curve
✗ Joining the two branches of $y = k/x$	✓ They never meet — break the curve at $x = 0$
✗ Putting the turning point of $(x - 3)^2 + 4$ at $(-3, 4)$	✓ It is at $(3, 4)$

- Draw curves in pencil with one confident stroke.
- Use the symmetry of a quadratic to check your table.
- Label the curve with its equation when there is more than one on the grid.