

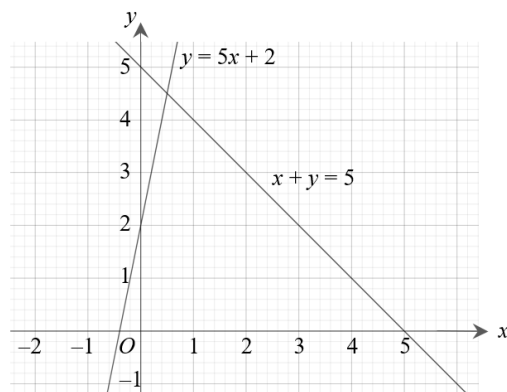
Examples - Solving Simultaneous Equations Graphically

Example 1 Solve the simultaneous equations $y = 5x + 2$ and $x + y = 5$ graphically.

$$y = 5 - x$$

$y = 5 - x$ has gradient -1 and y -intercept 5 .

$y = 5x + 2$ has gradient 5 and y -intercept 2 .



Lines intersect at
 $x = 0.5, y = 4.5$

Check:

First equation $y = 5x + 2$:

$$4.5 = 5 \times 0.5 + 2 \quad \text{YES}$$

Second equation $x + y = 5$:

$$0.5 + 4.5 = 5 \quad \text{YES}$$

1 Rearrange the equation $x + y = 5$ to make y the subject.

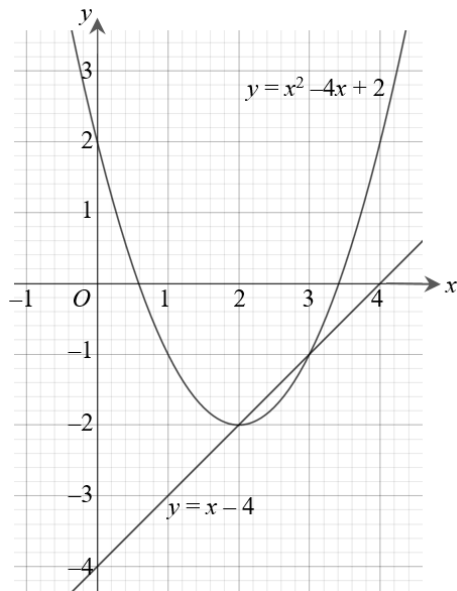
2 Plot both graphs on the same grid using the gradients and y -intercepts.

3 The solutions of the simultaneous equations are the point of intersection.

4 Check your solutions by substituting the values into both equations.

Example 2 Solve the simultaneous equations $y = x - 4$ and $y = x^2 - 4x + 2$ graphically.

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



The line and curve intersect at
 $x = 3, y = -1$ and $x = 2, y = -2$

Check:

First equation $y = x - 4$:

$$-1 = 3 - 4 \quad \text{YES}$$

$$-2 = 2 - 4 \quad \text{YES}$$

Second equation $y = x^2 - 4x + 2$:

$$-1 = 3^2 - 4 \times 3 + 2 \quad \text{YES}$$

$$-2 = 2^2 - 4 \times 2 + 2 \quad \text{YES}$$

- 1 Construct a table of values and calculate the points for the quadratic equation.
- 2 Plot the graph.
- 3 Plot the linear graph on the same grid using the gradient and y-intercept.
 $y = x - 4$ has gradient 1 and y-intercept -4 .
- 4 The solutions of the simultaneous equations are the points of intersection.
- 5 Check your solutions by substituting the values into both equations.

