

Solving simultaneous equations

Year 11 General Maths
Units 1 and 2

www.maffsguru.com

Learning Objectives

By the end of the lesson, I hope that you understand and can apply the following to a range of questions from the Unit 1 and 2 General Mathematics course.

- To be able to find the intersection point of two lines.
- To be able to solve simultaneous equations.

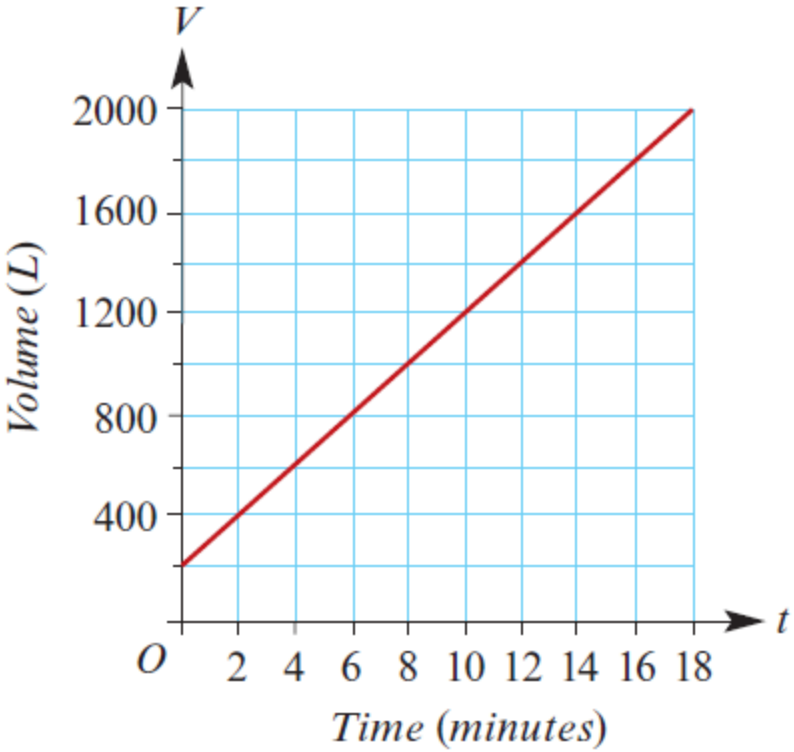


Recap

We have, in the last few lessons been looking at straight line graphs.

In all of them, each graph has only contained one straight line.

What happens if we put two straight lines on a graph?





Putting two straight lines on a graph

As it turns out, there are three things which might happen when we put straight lines on a graph:

1. They meet at only one point
2. They are parallel
3. They are the same line and so overlap each other

When they meet at only one point, we can find the point by using the process of **solving simultaneous equations**.

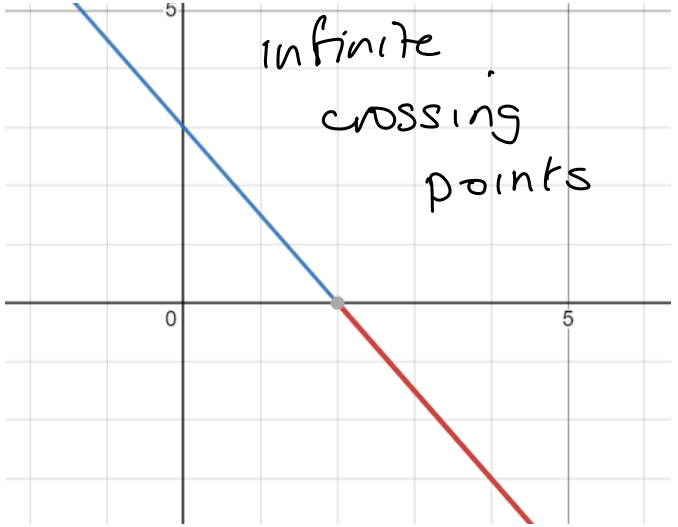
2.

never cross



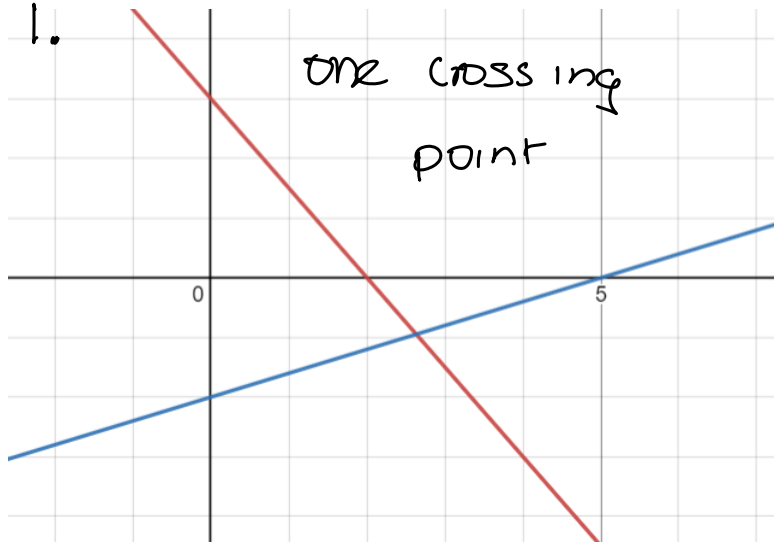
3.

infinite crossing points



1.

one crossing point



Solving simultaneous equations

We can find this crossing point (or lack thereof) in two ways:

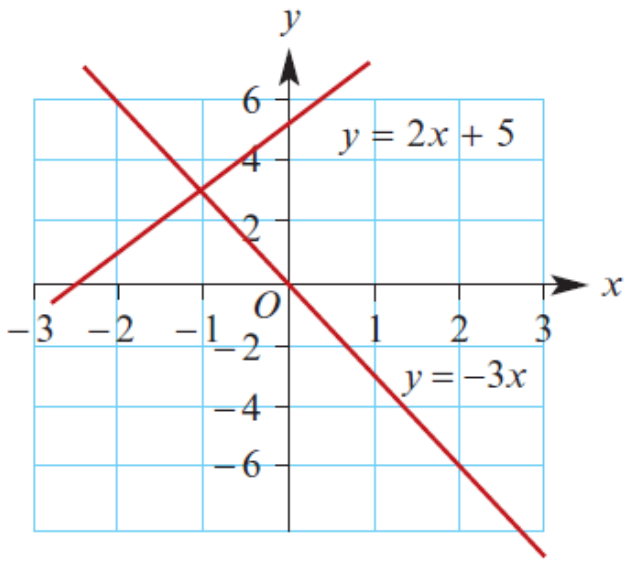
1. **Using the CAS**
2. **Reading from a graph**
3. Using algebra (and pencil and paper methods).

The good news is … we don't have to do it by hand any more!



Example: Finding the point by reading from the graph

The graphs of $y = 2x + 5$ and $y = -3x$ are shown. Write their point of intersection.

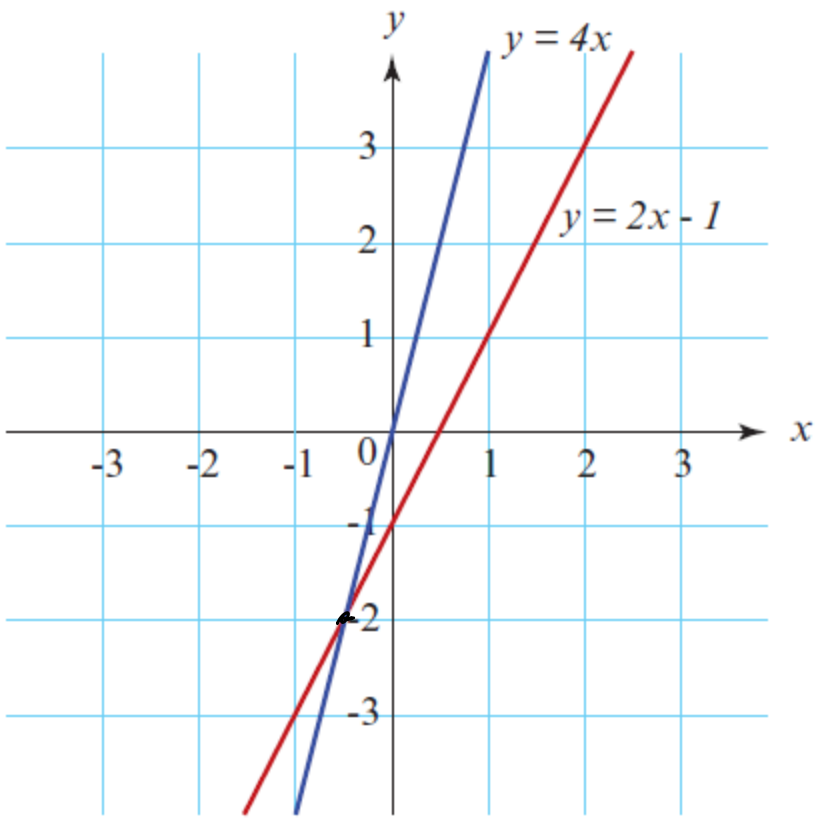


Pt of int = $(-1, 3)$



Example

The graphs of $y = 2x - 1$ and $y = 4x$ are shown. Write their point of intersection.



Pt of Int = $(-\frac{1}{2}, -2)$

This one doesn't seem to have a nice point which we can read off. So, we can check the answer using the CAS.



Using the CAS to find solutions to simultaneous equations

Knowing how to use the CAS properly will save hours and hours of work and allow us to pick up easy marks in the exams.

Use a CAS calculator to find the point of intersection of the simultaneous equations $y = 2x + 6$ and $y = -2x + 3$.

Pt of Int = $(-0.75, 4.5)$

(x, y)



Example

Solve the following pair of simultaneous equations:

$$24x + 12y = 36$$

$$45x + 30y = 90$$

$x = 0$

$y = 3$



Learning Objectives: Revisited

By the end of the lesson, I hope that you understand and can apply the following to a range of questions from the Unit 1 and 2 General Mathematics course.

- To be able to find the intersection point of two lines.
- To be able to solve simultaneous equations.



Work to complete

The work I am asking to be completed for this topic is shown below.

This is the minimum work which should be completed. The more questions which are answered the better your chance of success in exams. Questions towards the end of the exercises and in the Chapter Review are the best practice you can do.

Questions to complete:
Exercise 5H: All questions as there are only 4.

