

Thanks for opening this file. So, I am not sure which level are you! Year 7 and 8 should be able to work out some of them. Year 9 and 10 should be more confident and if you are in year 11 you should be able to do this well. So let's see if you can follow this!



### How can we simplify and expression like this one:

$$6x + 5x - 4 + 3x - 7 = 3$$

To simplify:

The "x" terms can be collected together to give

$$14x$$

The numbers can be collected together to give

$$14$$

The solution for this simple equation will be

$$x = 1$$

Have a look this:

$$6x + 5x - 4 + 3x - 7 = 3$$

$$6x + 5x + 3x = 3 + 7 + 4$$

Therefore:

$$14x = 14$$

$$\text{So } x = 1$$

## Which functions are nonlinear?

$$y = 4x + 3$$

$$y = 9x - 7$$

$$y = 3x^2 - 5$$
 \*\*\* I am sure you knew \*\*\*\*

$$y = 6x + 15$$

If you are not sure could you plot them? By the way try without using a graph calculator!

I have seen children with some fundamental errors.

An easy year 10 question:

## Use correctly the distributive property and simplify:

$$7(5y + 3)$$

*solution :*

$$35y + 21$$

Things like that are really important! Remember if you made a fundamental error, the error will carry all the way to the end.

## Which questions do you think will be in the exam? (Year 10 pupil question)

Firstly I am not a "Fortune teller" however I love "Simultaneous equations" and I will be surprised if those are not getting in your exams papers. So make sure you do plenty of these. (Below is an easy problem if you are in year 11)

Example:

$$y = 7x + 1$$

$$y = -x - 2$$

They can ask you a lot of things. Perhaps you need to plot both equations and find out where they cross. Perhaps they'll never cross; if that's the case you should justify this (that one above crosses).

You must have really clear how the coordinates are and represents in the graph, usually  $(x,y)$ . This sometimes could be a bit confusing for the children if the teacher in the class uses different variables for some other problems.

So let's see if you can work out this one:

If you want to plot the two graphs give different values to  $x$  and find out the  $y$  value.

Example: Use the first equation  $y = 7x + 1$

If  $x=0$  then  $y=1$

If  $x=1$  then  $y=8$

If  $x=2$  then  $y=15$

If  $x=-1$  then  $y=-6$

If  $x=-2$  then  $y=-13$

Now use the second equation:

Example: Use the first equation  $y = -x - 2$

If  $x=0$  then  $y=-2$

If  $x=1$  then  $y=-3$

If  $x=2$  then  $y=-4$

If  $x=-1$  then  $y=-1$

If  $x=-2$  then  $y=0$

Now you can plot them **\*\* Remember  $x$  (horizontal axes) and  $y$  (vertical axes) \*\***

So, you have now realised that unfortunately is not a nice integer number crossed. If you done it right  $(x,y)$  are  $(-0.375, -1.625)$

So how can we find this?

$$y = 7x + 1$$

$$y = -x - 2$$

$$7x + 1 = -x - 2$$

$$8x + 1 = -2$$

$$8x = -3$$

$$x = -\frac{3}{8}$$

*therefore*

$$y = 7\left(-\frac{3}{8}\right) + 1$$

$$y = -\frac{21}{8} + 1$$

$$y = -\frac{13}{8}$$

So, I have proved to you that the crossing point is (-0.375, -1.625)

**This of course will get a bit more difficult in year 11 with Coordinate graphs, calculating distances in between points or with Quadratic equations.**