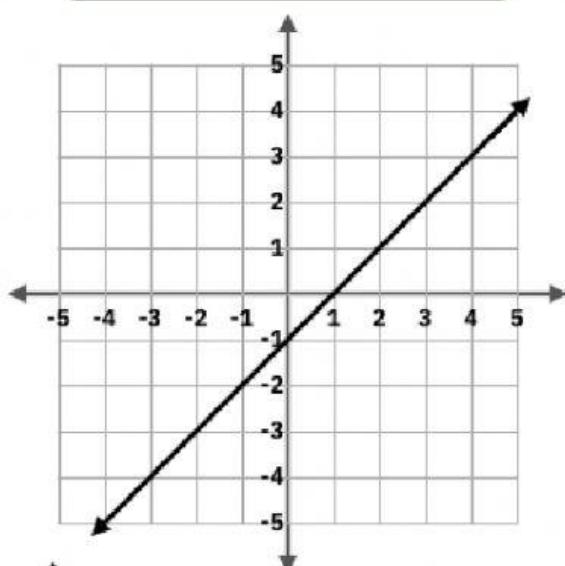
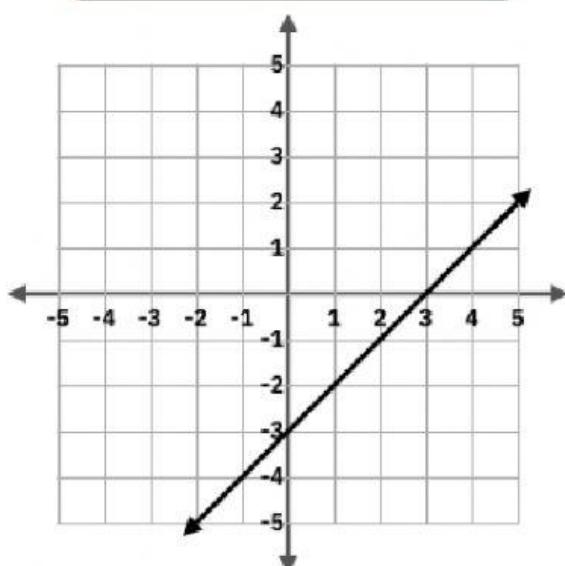
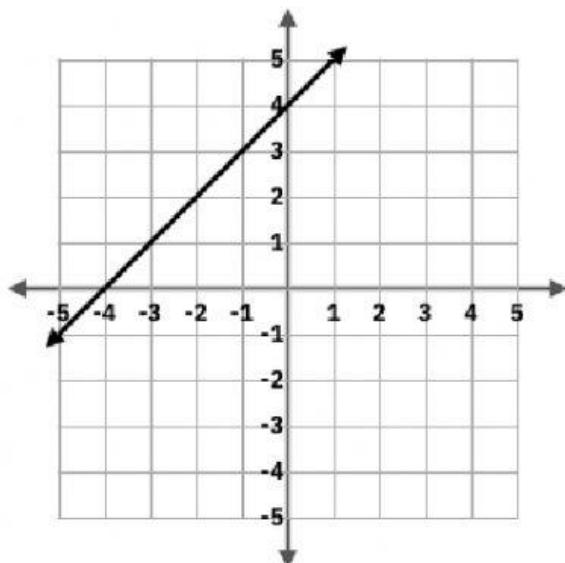
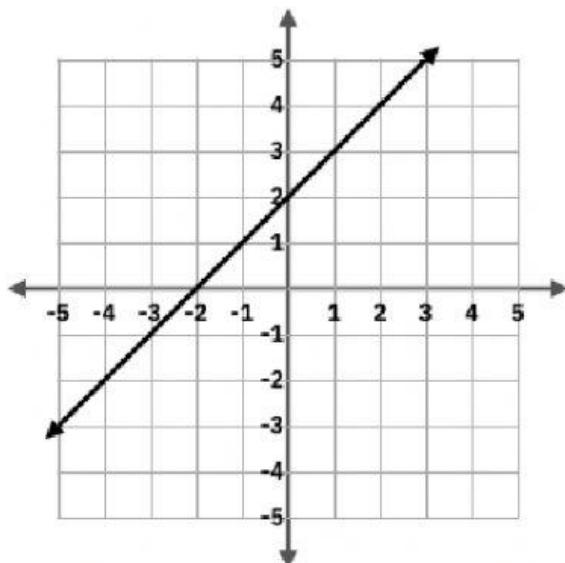


## Straight Lines graphs

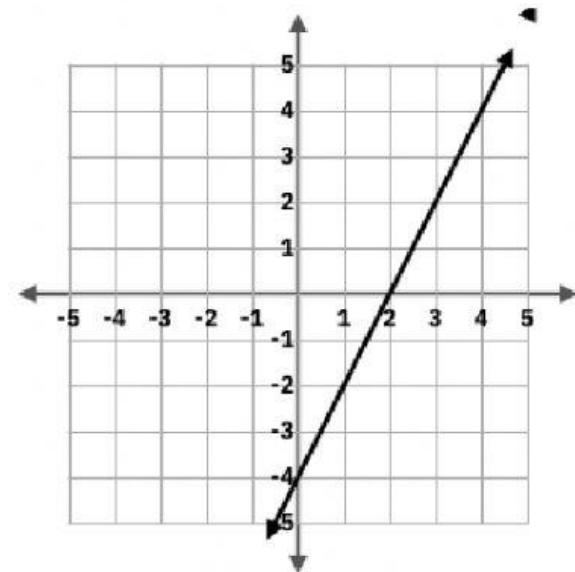
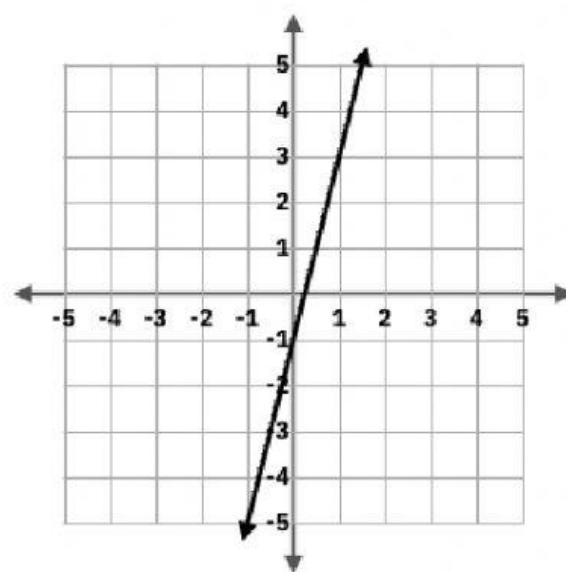
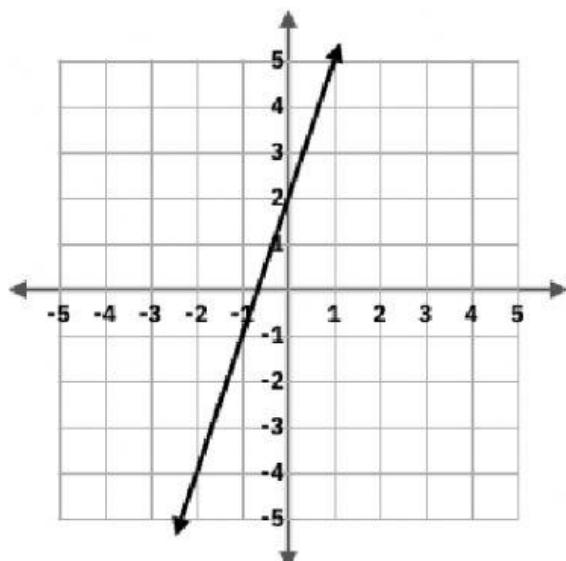
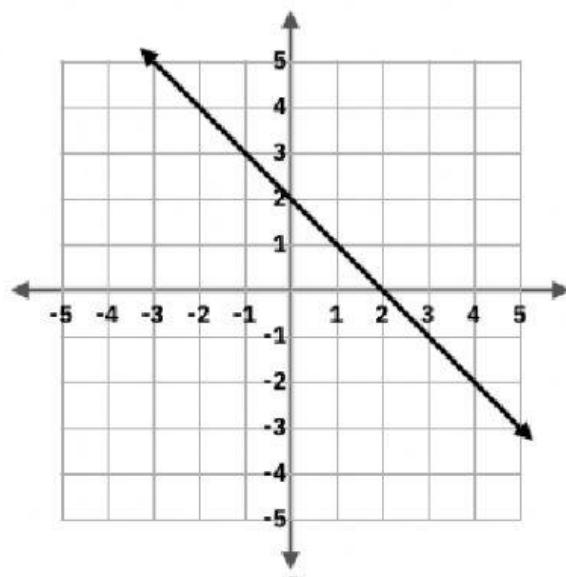
Directions to find the equation of the line:  $y = mx + c$

- To find the gradient (m) of the slope we use the formula rise  $\div$  run
- To find the intercept (c) we look where the line crosses the y axis

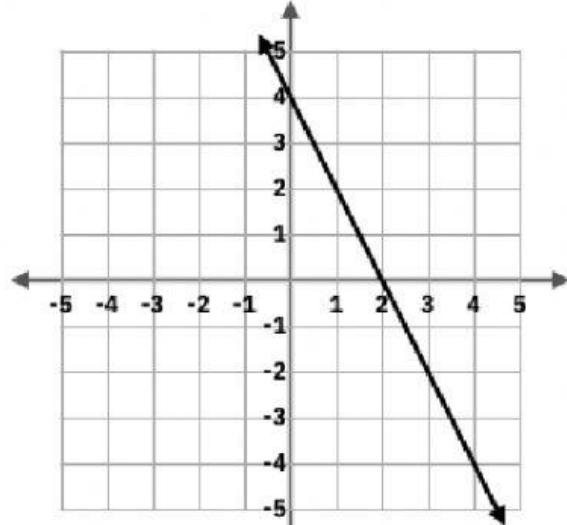
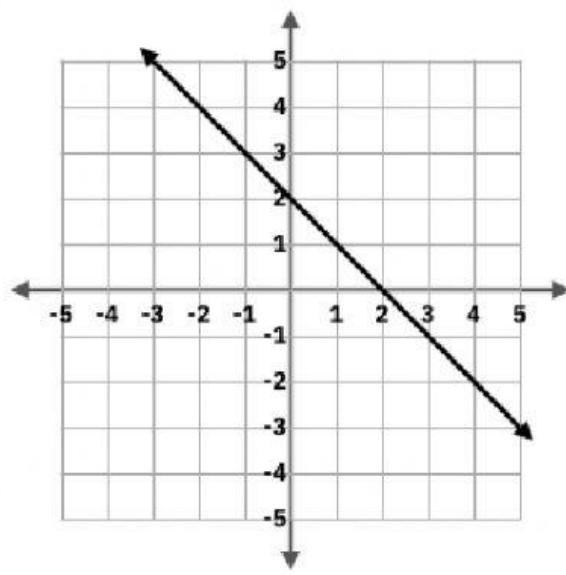
Find the equation of the line for each of the following graphs:



Stage 2 - different gradients - write your answers underneath the graph



Stage 3 - negative gradients



Drawing graphs - We need to be able to plot straight line graphs.

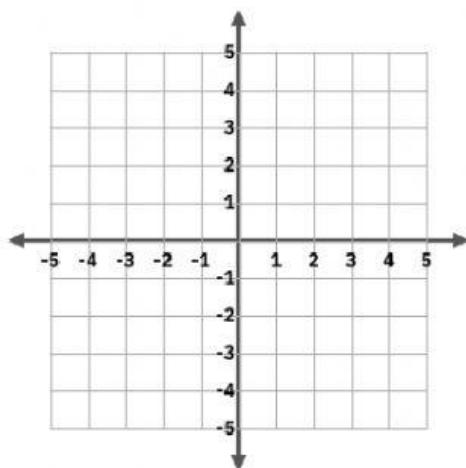
For example  $y = x + 2$

This means the y coordinate is equal to whatever the x coordinate is plus 2 more.

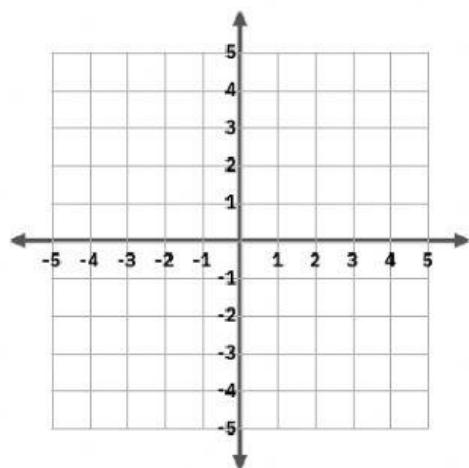
If the x coordinate is 3 then y is  $3+2=5$ . So we would plot the coordinate (3,5)

1)  $y = x + 1$

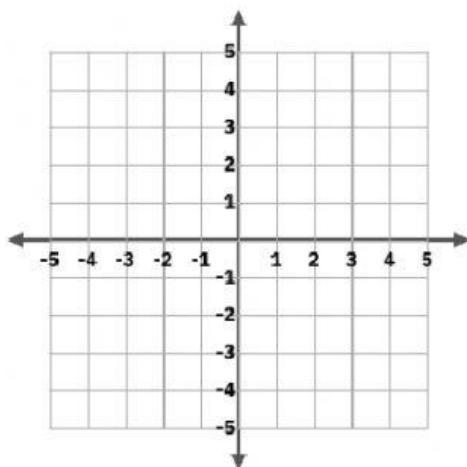
x	-1	0	1	2
y				



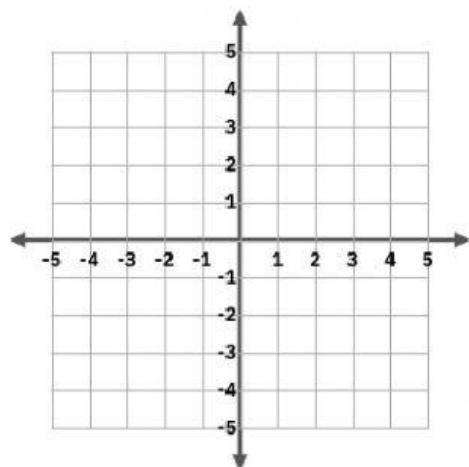
2)  $y = x - 1$



3)  $y = 2x + 2$



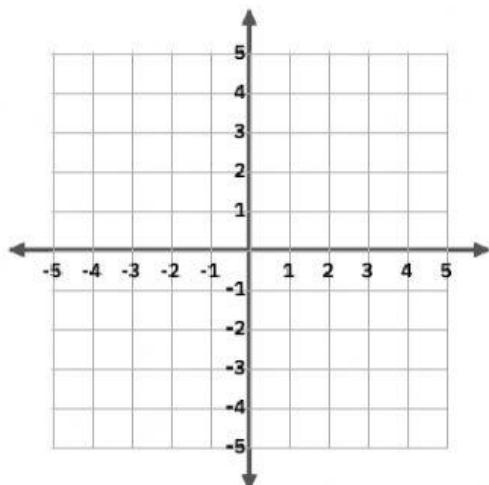
4)  $y = 3x - 1$



### Challenge question

Draw the graph of  $y = x^2 + 2x + 3$

x	-1	0	1
$x^2$			
$+2x$			
$+3$			
$y =$			



When given the equation of the line we can pick out the gradient (m) and the intercept (c - where the line crosses the y axis). The line should always follow the pattern  $y = mx + c$ . If it does not follow this pattern we need to rearrange the equation until it does.

Easy

$$y = 4x - 5$$

$$m =$$

$$c =$$

Medium

$$y = 2x$$

$$m =$$

$$c =$$

$$y = 2 - 3x$$

$$m =$$

$$c =$$

Hard

$$2y = 4x + 14$$

$$m =$$

$$c =$$

$$3y = 2x + 12$$

$$m =$$

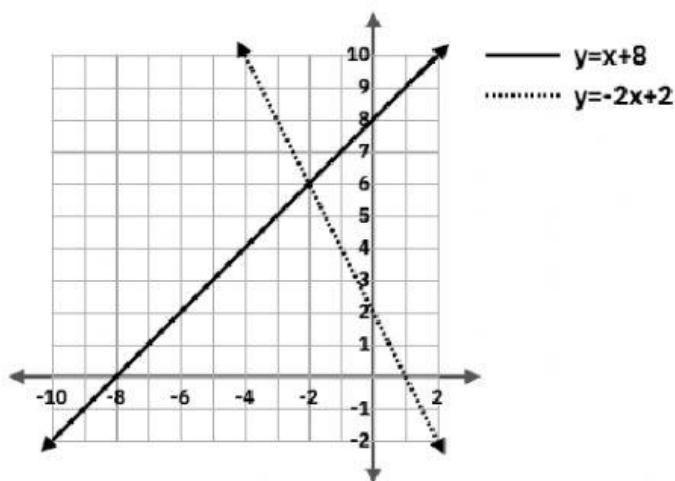
$$c =$$

Simultaneous Equations - This is where two straight lines cross each other at a single coordinate. We can solve this using a graph or using algebra

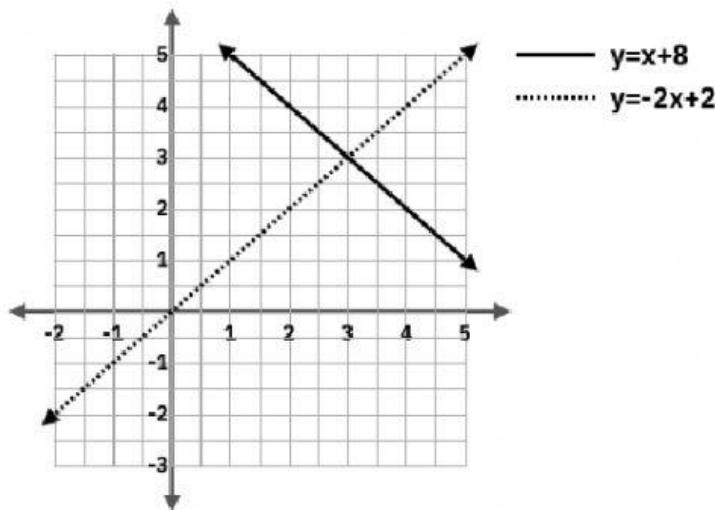
These two lines cross at the Point (\_\_\_\_, \_\_\_\_)

$$x = \underline{\hspace{2cm}}$$

$$y = \underline{\hspace{2cm}}$$



Solve these simultaneous equations graphically



Simultaneous equations using algebra:

- Look to see if either the x or the y values are the same
- If they are look at the sign (+/-) in front of the them
- If the sign is the same i.e. both + or both - then SUBTRACT the equations
- If the signs are different i.e. one - and one + you ADD

Solve the simultaneous equations - same coefficient (letter before y)

$$\begin{aligned} 1. \quad 4x + 2y &= 10 \\ x + 2y &= 7 \end{aligned}$$

$$\begin{aligned} 2. \quad 6x + y &= 18 \\ 4x + y &= 14 \end{aligned}$$

$$\begin{aligned} 3. \quad 5x - 2y &= -23 \\ 5x - 6y &= -39 \end{aligned}$$

$$\begin{aligned} 3. \quad 4x + 2y &= 10 \\ 4x + 8y &= 28 \end{aligned}$$

Medium

If the values before x/y are not the same then we need to multiply the one of the equations until they are

$$5x + 2y = 11$$

$$3x - 4y = 4$$

Hard

Sometime we may need to multiply both equations before we can start

$$3x + 5y = 13$$

$$2x + 2y = 6$$