

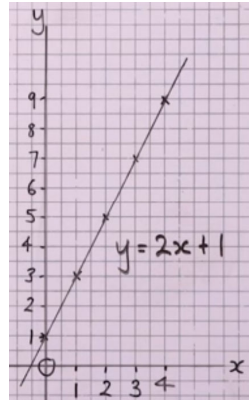
### 1. Plotting straight line graphs using a table

Draw the graph of the line  $y = 2x + 1$

To get the  $y$  coordinate given the  $x$ :



X	0	1	2	3	4
y	1	3	5	7	9



Plot the coordinates from the table

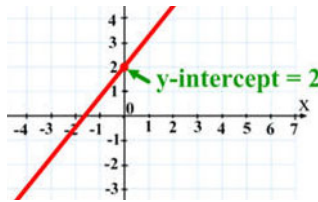
$(0, 1)$   $(1, 3)$   $(2, 5)$   $(3, 7)$   $(4, 9)$

Your points should form a straight line.

Join the points with a ruler.

### 2. Intercept

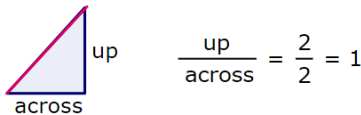
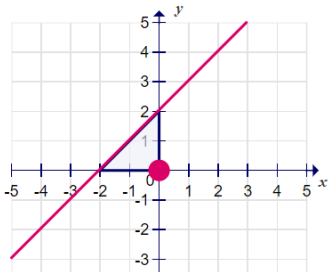
Where the line crosses the  $y$  axis. It can be written as a coordinate  $(0, 2)$



### 3. Gradient

How steep the line is, the steeper the line the bigger the gradient.

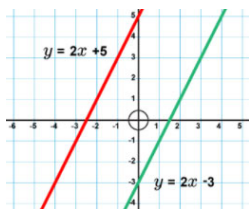
If the line goes up from left to right it has a **positive** gradient.  
If the line goes down from left to right it has a **negative** gradient.  
We draw a triangle under the line, and calculate the value of:



### 5. Parallel lines

Parallel lines are like train tracks they stay the same distance apart and never meet.

Parallel lines have the same gradient



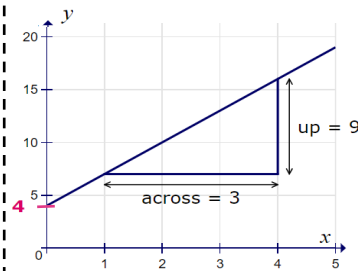
## Maths Y9 - Graphs

### 4. The equation of a straight line

$$y = mx + c$$

$m$  = gradient of the line  
 $c$  =  $y$  intercept  
(where the line crosses the  $y$  axis)

Find the equation of this line



This line intercepts the  $y$  axis at 4.

$$c = 4$$

$$y = mx + 4$$

The gradient is:

$$\frac{\text{up}}{\text{across}} = \frac{9}{3} = 3$$

$$m = 3$$

$$y = 3x + 4$$

The equation of this line is:

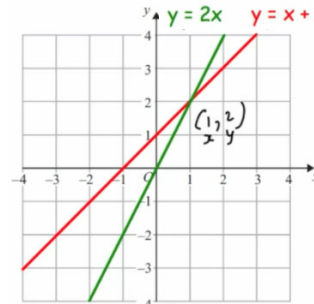
### 6. Solving simultaneous equations graphically

Solve these simultaneous equations by drawing their graphs.

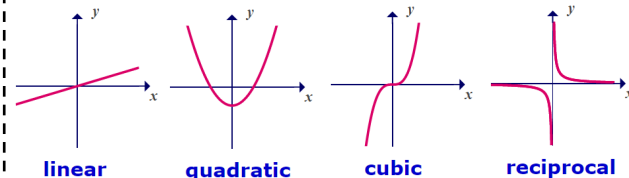
$$y = 2x \text{ and } y = x + 1$$

The point of intersection is  $(1, 2)$ .  $x = 1$  and  $y = 2$

The coordinates of the **point of intersection** are the solution of the simultaneous equations.



### 7. Recognising graphs



### 8. Plotting quadratic graphs

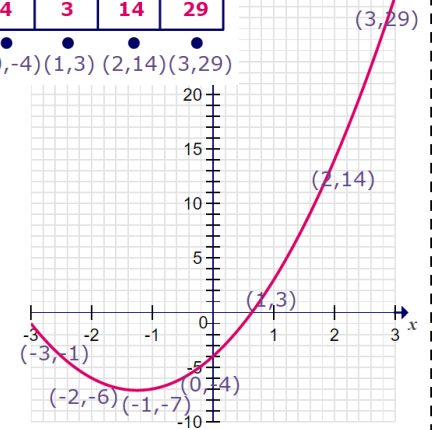
Draw the graph of  $y = 2x^2 + 5x - 4$  for  $-3 \leq x \leq 3$ ?

x	-3	-2	-1	0	1	2	3
$2x^2$	18	8	2	0	2	8	18
$5x$	-15	-10	-5	0	5	10	15
-4	-4	-4	-4	-4	-4	-4	-4
y	-1	-6	-7	-4	3	14	29

To work out  $2x^2$ , first square  $x$ , then multiply by 2.  
 $(-3)^2 = 9$   
 $2 \times 9 = 18$

$(-3, -1)$   $(-2, -6)$   $(-1, -7)$   $(0, -4)$   $(1, 3)$   $(2, 14)$   $(3, 29)$

Calculate each term separately and then add your answers for each row of the table together to find the  $y$  coordinate.



### 9. Plotting cubic graphs

Draw the graph of  $y = x^3 - 5x^2 + x + 2$  for  $-1 \leq x \leq 5$ .

x	-1	0	1	2	3	4	5
$x^3$	-1	0	1	8	27	64	125
$-5x^2$	-5	0	-5	-20	-45	-80	-125
x	-1	0	1	2	3	4	5
2	2	2	2	2	2	2	2
y	-5	2	-1	-8	-13	-10	7

Remember, to work out  $-5x^2$ , first square  $x$ , then multiply by  $-5$ .  
 $(-1)^2 = 1$   
 $-5 \times 1 = -5$

$(-1, -5)$   $(0, 2)$   $(1, -1)$   $(2, -8)$   $(3, -13)$   $(4, -10)$   $(5, 7)$

Calculate each term separately and then add your answers for each row of the table together to find the  $y$  coordinate.

