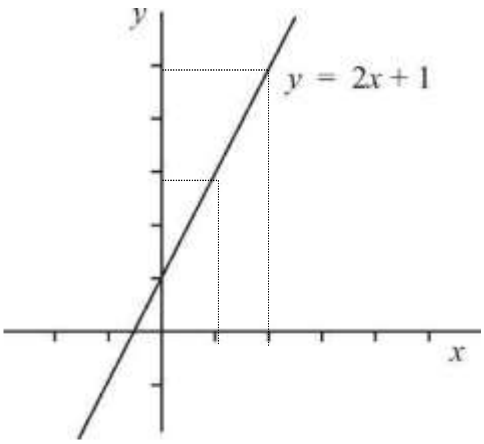
7.4.3 THE Y-INTERCEPT OF A LINE

Consider the straight line with equation y = 2x + 1. To draw a sketch of the line, we must calculate some values.

y= 2x + 1

x	y
0	1
1	3
2	5
3	7



Notice that when x = 0 *the value of y is* 1*. So this line cuts the y-axis at y =*1.

The general equation of a straight line is y = mx + c, where m is the gradient, and y = c is the value where the line cuts the y-axis. This number c is called the **intercept** on the y-axis or **y-intercept**.

We are sometimes given the equation of a straight line in a different form. Suppose we have the equation 3y — 2x = 6. We can use algebraic rearrangement to obtain an equation in the form

y = mx + c:

3y - 2x = 6 ,

3y = 2x + 6 ,

$y = \frac{2}{3}x + \mathbf{2}$

So now the equation is in its standard form, and we can see that the gradient is $\frac{2}{3}$ and the intercept value on the y-axis is 2.

SELF-ASSESSMENT ACTIVITY

1. Determine the gradient and y-intercept for each of the straight lines in the table below.

Equation	Gradient	y-intercept
y = 3x + 2		
y = 5x - 2		
y = - 2x + 4		
y = 12x		
$y = \frac{1}{2} - \frac{2}{3}$		
2 y – 10x = 8		
x + y + 1 = 0		

2. Find the equation of the lines described below (give the equation in the form y = mx + c:

   (a) gradient 5, y-intercept 3;

   (b) gradient -2, y-intercept -1;

   (c) gradient 3, passing through the origin;

   (d) gradient$\frac{1}{3}$ passing through (0,1);

   (e) gradient $-\frac{3}{4}$, y-intercept $\frac{1}{2}$