

### 7.4.1 DEFINITION

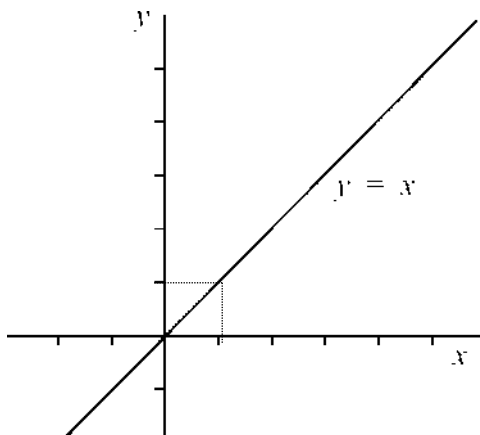
Equations of straight lines are in the form  $y = mx + c$  ( $m$  and  $c$  are numbers).  $m$  is the gradient of the line and  $c$  is the  $y$ -intercept

We can find the equation of a straight line, when we are given some information about the line. The information could be the value of its gradient, together with the co-ordinates of a point on the line. Alternatively, the information might be the co-ordinates of two different points on the line. There are several different ways of expressing the final equation, and some are more general than others.

### 7.4.2 THE EQUATION OF A LINE THROUGH THE ORIGIN WITH A GIVEN GRADIENT

Suppose we have a line with equation  $y = x$ . Then for every point on the line, the  $y$  co-ordinate must be equal to the  $x$  co-ordinate. So the line will contain points in the following list

X	Y
0	0
1	1
2	2



We can find the gradient of the line using the formula for gradients,

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1 - 0}{1 - 0} = 1$$

In general, therefore, the equation  $y = \mathbf{m}x$  represents a straight line passing through the origin with gradient **m**.