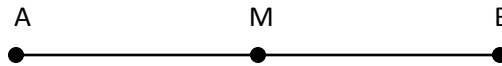


## Lesson 2 – *Midpoint of a segment*

Definition: The point which divides a line segment into two equal parts is called the midpoint of that segment.



The coordinates of point M can be found using the following:

$$x_M = \frac{x_1 + x_2}{2}$$

$$y_M = \frac{y_1 + y_2}{2}$$

Ex. Given A (-1,4) and B(5, -2) find the coordinates midpoint M of  $\overline{AB}$ .

$$x_M = \frac{-1 + 5}{2}$$

$$y_M = \frac{4 + -2}{2}$$

$$x_M = \frac{4}{2}$$

$$y_M = \frac{2}{2}$$

$$x_M = 2$$

$$y_M = 1$$

Therefore the coordinates of M are (2,1).

Ex. Given M(1,-2) the midpoint of  $\overline{AB}$  . Determine the coordinates of B if A(-3,4).

ie. Find B( $x_2, y_2$ )

$$x_M = \frac{x_1 + x_2}{2}$$

$$y_M = \frac{y_1 + y_2}{2}$$

$$1 = \frac{-3 + x_2}{2}$$

$$-2 = \frac{4 + y_2}{2}$$

$$2 = -3 + x_2$$

$$-4 = 4 + y_2$$

$$5 = x_2$$

$$-8 = y_2$$

Therefore the coordinates of point B are (5,-8)