**Point of Division**

The formula for finding the point of division is similar to the midpoint formula:

If P is located $\frac{a}{b}$ of the way from A to B, its coordinates are:

( x1 + $\frac{a}{b}$ (x2 – x1) , y1 + $\frac{a}{b}$ ( y2 – y1) )

\*Remember to label A(x1, y1) and B(x2, y2)

*Example:*

Find the coordinate of point P

1. If P is located $\frac{2}{5}$ of the way along line segment AB.

A (-1, 2) B (-16, 2)

A(x1, y1) B(x2, y2)

( x1 + $\frac{a}{b}$ (x2 – x1) , y1 + $\frac{a}{b}$ ( y2 – y1) )

( -1 + $\frac{2}{5}$ (-16 – -1) , 2 + $\frac{2}{5}$ ( 2 – 2) )

( -1 + $\frac{2}{5}$ (-15) , 2 + $\frac{2}{5}$ ( 0) )

( -1 + (-6) , 2 + (0 ) )

( -7 , 2 )

1. P is located $\frac{3}{8}$ of the way along BA

B (-4, -1)

A (-12, -17)

 A (-12, -17) B (-4, -1)

A(x1, y1) B(x2, y2)

( x1 + $\frac{a}{b}$ (x2 – x1) , y1 + $\frac{a}{b}$ ( y2 – y1) )

( -12 + $\frac{5}{8}$ (-4 – -12) , -17 + $\frac{5}{8}$ ( -1 – -17) )

( -12 + $\frac{5}{8}$ (8) , -17 + $\frac{5}{8}$ (16) )

( -12 + (5), -17 + (10) )

( -7, -7)

Why did I use the fraction of 5/8 and not 3/8?

1. P divides AB into a ratio of 3 : 1

A (-3, 1)

B (5, 3)

1. P divides AB into a ratio of 1 : 2

A (14, 4)

B (2, 1)