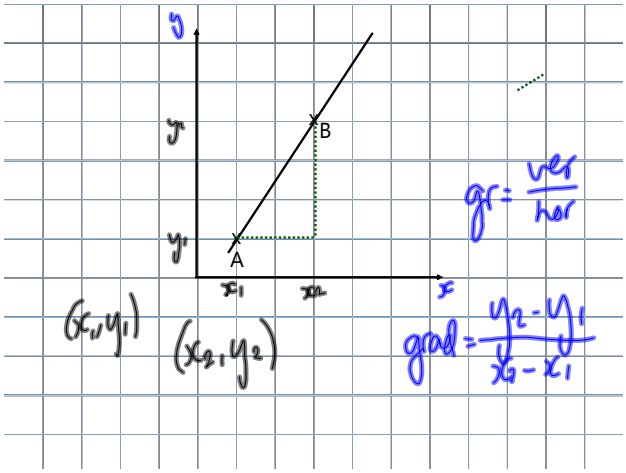
Today's Learning:

To calculate the gradient of a straight line using a formula.



Gradient of a Straight Line 23/11/18

The gradient of a line can be calculated by using

$$\frac{\text{vertical distance}}{\text{horizontal distance}}$$

Or, given coordinates of points on the line (x_1, y_1) and (x_2, y_2), we can use:

$$\text{gradient} = \frac{y_2 - y_1}{x_2 - x_1}$$

Parallel lines have the same gradient.

E.g. Find the gradient of the straight line that passes through

1) (4, 4) and (6,8). $x_1\ y_1$ $x_2\ y_2$ $gr = \frac{8-4}{6-4} = \frac{4}{2} = 2$

2) (-4,-3) and (2,10) $x_1\ y_1$ $x_2\ y_2$ $gr = \frac{10-(-3)}{2-(-4)} = \frac{13}{6}$

Positive gradients:

Negative gradients:

Today's Learning:

To finish gradient of a straight line.

Without a calculator, find the **gradient** of the straight line joining these points:

1) (-1, 3) and (-2, 10)
2) (-1, -5) and (-2, -2)
3) (3, -5) and (5, -6)
4) (2.5, 6) and (3.5, 7.5)
5) (-3.7, 4.5) and (3.5, 6.5)
6) (2.2, 1.4) and (-0.2, 2.2)

ANSWERS

1) -7
2) -3
3) -½
4) 1.5
5) $\frac{5}{18}$
6) $-\frac{1}{3}$

★ If points are **collinear**, they all lie on the same straight line. (To prove collinearity, two straight lines must share a point and have the same gradient).

e.g. If A(-4, -2), B(-1, 1) and C(8, k) are collinear, find the value of k.

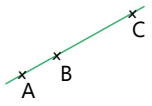
$grad_{AB} = \frac{1--2}{-1--4} = \frac{3}{3} = 1$

$grad_{BC} = 1 = \frac{k-1}{8--1}$

$1 = \frac{k-1}{9}$

$9 = k - 1$

$10 = k$



★ To prove collinearity of A, B and C, show AB grad = BC grad and state AB and BC both share point B.