



3055 BA SANGAM COLLEGE

PH: 6674003/9264117 E-mail: basangam@connect.com.fj



WORKSHEET 18

School: Ba Sangam College

Year / Level: 11

Subject: Mathematics

Name of Student: _____

Strand	3 - COORDINATE GEOMETRY
Sub strand	Gradient of a straight line
Content Learning Outcome	To find gradient of two points

GRADIENT OF STRAIGHT LINE

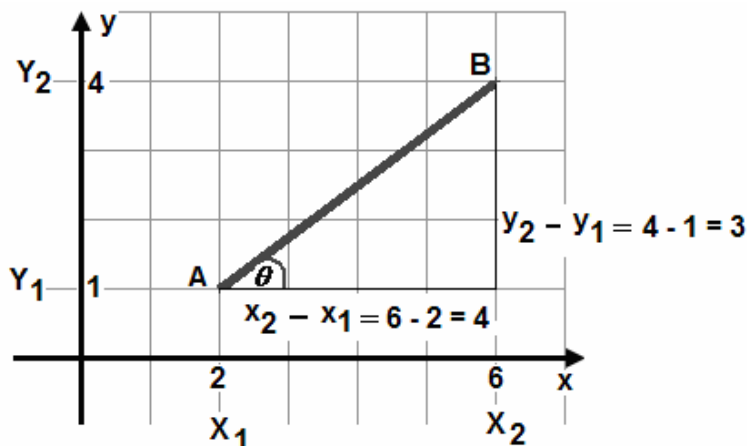
Objective: To find the gradient of two points or a line on a Cartesian plane

Let $A(x_1, y_1)$ and (x_2, y_2) be any two points on a straight line. The slope or the gradient of the line AB can be calculated by the formula given below.

$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad \text{or} \quad m = \tan \theta \quad m \rightarrow \text{gradient}$$

Example 1

- Find the gradient of the line joining the points $A(2, 1)$ and $B(6, 4)$ in the diagram given on right
- Calculate the angle the line segment AB makes with the positive x-axis.



Solution

a)

b)

$$m = \frac{y_2 - y_1}{x_2 - x_1} \rightarrow m = \frac{4-1}{6-2} \rightarrow m = \frac{3}{4}$$

$$m = \tan \theta \rightarrow \frac{3}{4} = \tan \theta \rightarrow \tan^{-1}\left(\frac{3}{4}\right) = \theta \rightarrow \theta = 53.13^\circ$$

Example 2

- a. Find the gradient of the line joining the points $(1, 3)$ and $B(6, 8)$.
- b. Calculate the angle the line segment AB makes with the positive x-axis.

Solution

a) $m = \frac{y_2 - y_1}{x_2 - x_1} \rightarrow m = \frac{8-3}{6-1} \rightarrow m = \frac{5}{5} \rightarrow m = 1$

b) $m = \tan \theta \rightarrow 1 = \tan \theta \rightarrow \tan^{-1}(1) = \theta \rightarrow \theta = 45^\circ$

EQUATION OF STRAIGHT LINE

Objective: To find the equation of a linear functions in the form $y=mx+c$

A line has an equation of the general form :

$$y = mx + c, \quad \text{where } m = \text{gradient and } c = y\text{-intercept}$$

Example

Find the gradient of a line with the equation $5x - 3y + 2 = 0$.

Solution

$5x - 3y + 2 = 0$	➤ Make y the subject
↓	
$5x + 2 = 3y$	➤ Take y to other side
↓	
$\frac{5}{3}x + \frac{2}{3} = \frac{y}{3}$	➤ Divide by 3
↓	
$\frac{5}{3}x + \frac{2}{3} = y$	➤ Cancel and simplify
↓	
$\frac{5}{3}x + \frac{2}{3} = y$	➤ Gradient is coefficient of x
↓	

$\therefore m = \frac{5}{3}$	
------------------------------	--

Activity:

1. Give the equation of the line passing through $(6, -4)$ with $m = 3$. (2 Marks)
2. Find the equation of the line passing through the points $(2,4)$ and $(-3,-6)$? (2 Marks)

