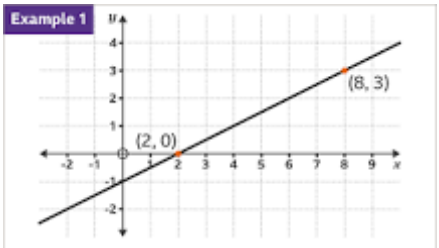
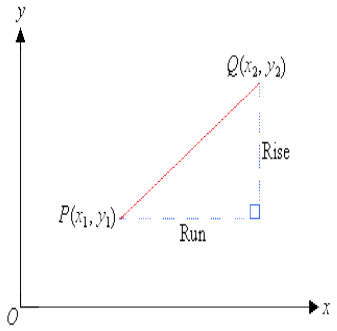
BASIC 8

WEEKLY LESSON PLAN – WEEK 7

Strand:	Algebra		**Sub-Strand:**	Patterns and Relations	
Content Standard:	B8.2.1.1 Demonstrate the ability to draw table of values for a linear relation, graph the relation in a number plane, determine the gradient of the line and use it to write equation of a line of the form y = mx + c.				
Indicator (s)	B8.2.1.1.2 1 Calculate the gradient of a line and use it to write equation of a line of the form y = mx + c.		**Performance Indicator:** Learners can calculate the gradient of lines.		
Week Ending	25-10-2024				
Class	B.S.8	**Class Size:**		**Duration:**	
Subject	Mathematics				
Reference	Mathematics Curriculum, Teachers Resource Pack, Learners Resource Pack, Textbook.				
Teaching / Learning Resources	Poster, Pictures, Word Chart, Graph book.		**Core Competencies:**	Generate hypothesis to help answer complex problems.	

DAY/DATE	**PHASE 1 : STARTER**	**PHASE 2: MAIN**	**PHASE 3: REFLECTION**
MONDAY	Discuss the equation of a straight line with the Learners.	1. Demonstrate finding the gradient of a straight line using the equation of the line. 2. Individual Learners practice finding the gradient of a line using the equation of the line. 3. Discuss with Learners how to find to find the gradient from a graph. 4. Assist Learners to determine gradients from graphs. **How do you calculate the gradient from a graph?**  The gradient of a line is calculated by dividing the difference in the -coordinates by the difference in the -coordinates. This may be referred to as the change in divided by the change in , or the vertical divided by the horizontal **Gradient of a Straight Line** The gradient of a straight line is the rate at which the line rises (or falls) vertically for every unit across to the right. That is:	Reflect on finding the gradient of a straight line. **Exercise;** Find the gradient using the line equation below; i. $yy = 5xx + 13$ ii. $2xx - 8yy + 3 = 0$ iii. $yy = -3xx + 12$ **Assignment;** 1. The cost of transporting documents by courier is given by the line segment drawn in the diagram.

$$\text{Gradient} = \frac{\text{Rise}}{\text{Run}}$$
$$= \frac{\text{Change in } y}{\text{Change in } x}$$
$$= \frac{y_2 - y_1}{x_2 - x_1}$$



Note:

The gradient of a straight line is denoted by *m* where:

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

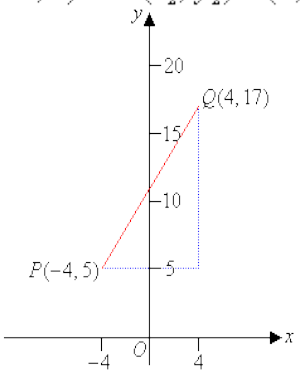
Example 3

Find the gradient of the straight line joining the points *P*(– 4, 5) and *Q*(4, 17).

Solution:

Let $(x_1, y_1) = (-4, 5)$ and $(x_2, y_2) = (4, 17)$.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
$$= \frac{17 - 5}{4 - (-4)}$$
$$= \frac{12}{8}$$
$$= 1.5$$

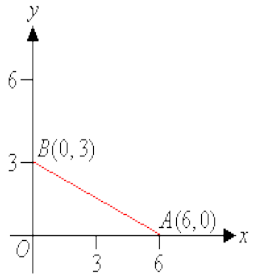


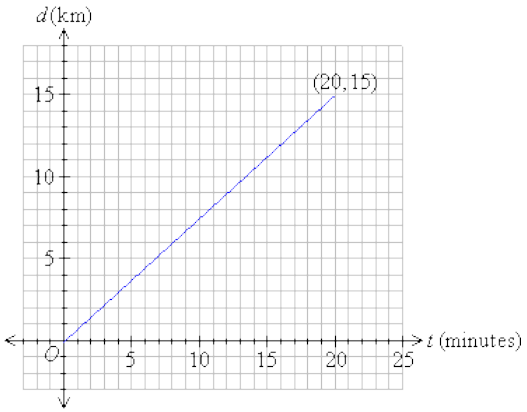
So, the gradient of the line *PQ* is 1.5.

Find the gradient of the line segment; and describe its meaning

2. A horse gallops for 20 minutes and covers a distance of 15 km, as shown in the diagram.

Find the gradient of the line and describe its meaning.

		Note: If the gradient of a line is positive, then the line slopes upward as the value of *x* increases. Example 4 Find the gradient of the straight line joining the points *A*(6, 0) and *B*(0, 3). *Solution:* Let $(x_1, y_1) = (6, 0)$ and $(x_2, y_2) = (0, 3)$. $m = \frac{y_2 - y_1}{x_2 - x_1}$ $= \frac{3-0}{0-6}$ $= \frac{3}{-6}$ $= -\frac{1}{2}$  So, the gradient of the line AB is $-\frac{1}{2}$. **Note:** If the gradient of a line is negative, then the line slopes downward as the value of *x* increases.	
WEDNESDAY	Learners brainstorm to mention examples of real-life application of gradients.	1. Assist Learners to find the gradient of real-life stories or word problems. 2. Learners in small groups to discuss real life problems about gradient and solve them. 3. Learners brainstorm to explain the importance of gradients in real life. **Applications of Gradients** Gradients are an important part of life. The roof of a house is built with a gradient to enable rain water to run down the roof. An aeroplane ascends at a particular gradient after take off, flies at a different gradient and descends at another gradient to safely land. Tennis courts, roads, football and cricket grounds are made with a gradient to assist drainage. Eg. A horse gallops for 20 minutes and covers a distance	Through questions and answers, conclude the lesson.

		of 15 km, as shown in the diagram. Find the gradient of the line and describe its meaning  *Solution:* Let $(t_1, d_1) = (0,0)$ and $(t_2, d_2) = (20,15)$. Now, $m = \frac{d_2 - d_1}{t_2 - t_1}$ $= \frac{15-0}{20-0}$ $= \frac{15}{20}$ $= \frac{3}{4}$ So, the gradient of the line is $\frac{3}{4}$ km/min. In the above example, we notice that the gradient of the distance-time graph gives the speed (in kilometres per minute); and the distance covered by the horse can be represented by the equation: $d = \frac{3}{4}t$ $(\because \text{Distance} = \text{Speed} \times \text{Time})$	
FRIDAY	Review Learners knowledge on the previous lesson.	1. Demonstrate how to find the slope-intercept form of the equation of a straight line. 2. Assist Learners to practice finding the slope-intercept form of the equation of a straight line. 3. Discuss with Learners how to find the point-slope form of the equation of a straight line. **The equation of a straight line in slope-intercept form is *yy = mmxx + cc*** i. Find the equation of a line with slope 2 and y-intercept	Learners in small groups to find the point-slope form of the equation of straight lines.

		-3. Hence find the value of y when x is 4. ii. Find the equation of a line in slope-intercept form having y-intercept 7/2 and slope - 5/2 .iii. Find the equation of a line with slop ½ and y-intercept 4. **The point-slope form of the equation of a straight line is $yy - yy1 = mm(xx - xx1)$** i. Find the equation of a line with slop 2/3 that passes through the point (3, -1). ii. Find the equation of a line that passes through the point (3, -7) and has the slop mm = 5/4 .iii. Find the equation of a line which passes through the points (5, 4) and (-10,-2). iv. Write the equation $5xx + 4yy - 3 = 0$ in the form form$yy = mmxx + aa$. Hence state the gradient and the intercept.	

Name of Teacher: **School:** **District:**