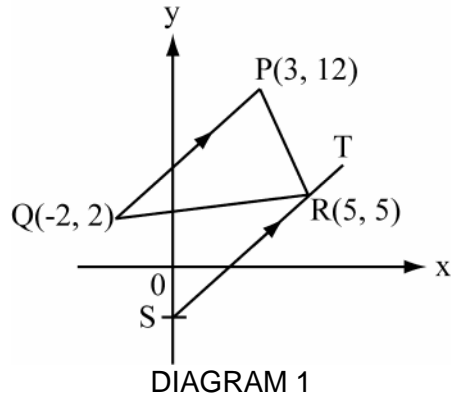


MODUL 7
MATEMATIK SPM "ENRICHMENT"
TOPIC: THE STRAIGHT LINE
TIME : 2 HOURS

1. The diagram below shows the straight lines PQ and SRT are parallel.



Find

- (a) the gradient of the line PQ.

[2 marks]

- (b) the equation of the line SRT.

[2 marks]

- (c) the x- intercept of the line SRT.

[1 mark]

Answers:

(a)

(b)

(c)

2. The diagram below shows that the straight line EF and GH are parallel.

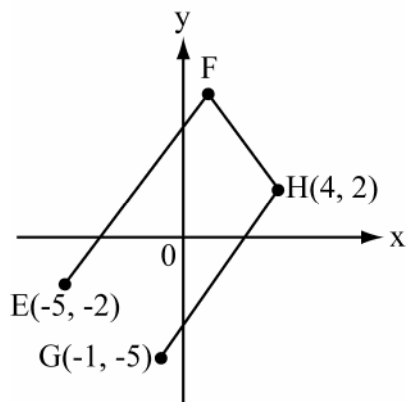


DIAGRAM 2

Find

- (a) the equation of EF.

[3 marks]

- (b) the y - intercept and x - intercept of EF.

[2 marks]

Answers:

(a)

(b)

3. The diagram below shows STUV is a trapezium.

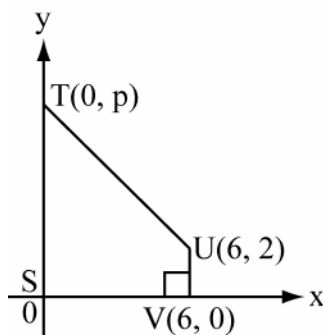


DIAGRAM 3

Given that gradient of TU is -3, find

(a) the coordinates of point T.

[2 marks]

(b) the equation of straight line TU.

[1 mark]

(c) the value of p, if the equation of straight line TU is $2y = \frac{1}{3}x + 18$

[2 marks]

Answers:

(a)

(b)

(c)

4. The diagram below shows a straight line EFG.

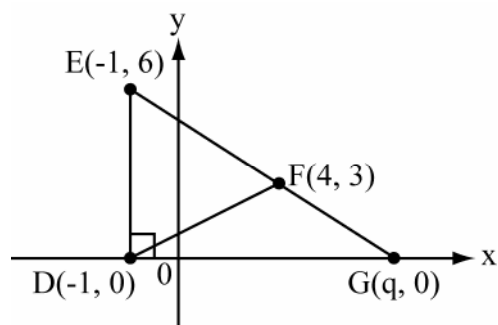


DIAGRAM 4

Find

- (a) the gradient of straight line EFG.

[1 mark]

- (b) the value of q.

[2 marks]

- (c) the gradient of straight line DF

[2 marks]

Answers:

(a)

(b)

(c)

5. The diagram below shows that EFGH is parallelogram.

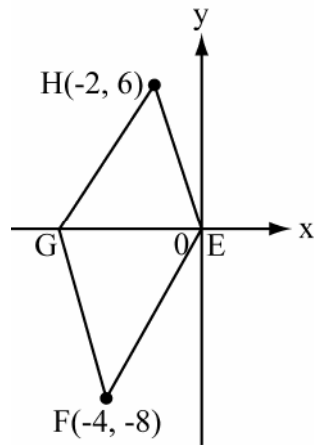


DIAGRAM 5

Find

(a) the equation of the straight line GH.

[3 marks]

(b) the x - intercept of the straight line FG.

[2 marks]

Answer:

(a)

(b)

6. The diagram below shows that EFGH is a trapezium.

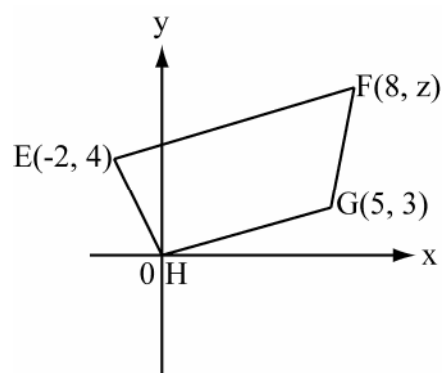


DIAGRAM 6

Find

- (a) the value of z .

[2 marks]

- (b) the equation of the line EF.

[2 marks]

- (c) the x - intercept of the line EF.

[1 mark]

Answers:

(a)

(b)

(c)

7 The diagram below shows that EFGH and HIJ are straight lines.

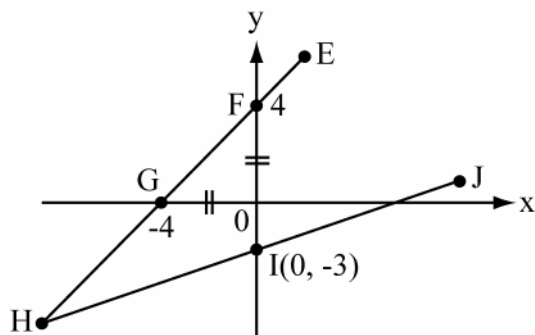


DIAGRAM 7

- (a) state the gradient of EFGH. [1 mark]

- (b) if the gradient of HIJ is 5, find the x - intercept. [1 mark]

- (c) find the equation of HIJ. [3 marks]

Answers:

(a)

(b)

(c)

8. The diagram below shows that PQR and RS are straight lines.

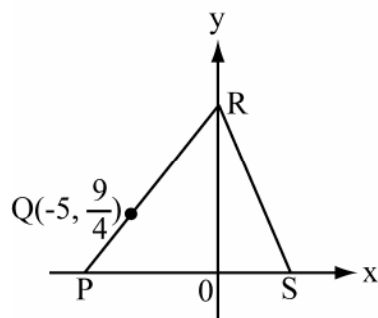


DIAGRAM 8

Given that x-intercept of PQR and RS are -8 and 6 respectively.

- (a) Find the gradient of PQR.

[2 marks]

- (b) Find the y-intercept of PQR.

[2 marks]

- (c) Hence, find the gradient of RS.

[1 mark]

Answers:

(a)

(b)

(c)

9. The diagram below shows that EFG, GHJK and KL are straight lines.

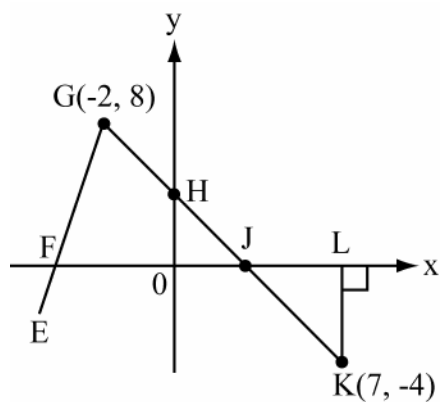


DIAGRAM 9

Given that the gradient of EFG is 2.

(a) Find the equation of

(i) LK

[1 mark]

(ii) EFG

[1 mark]

(b) Find the equation of GHJK. Hence, find the coordinates of H and J.

[2 marks]

Answers:

(a) (i)

(ii)

(b)

10. Find the point of intersection for each pair of straight line by solving the simultaneous equations.

(a) $3y - 6x = 3$
 $4x = y - 7$

[2 marks]

(b) $y = \frac{2}{3}x + 3$
 $y = \frac{4}{3}x + 1$

[3 marks]

Answers:

(a)

(b)

MODULE 7- ANSWERS
TOPIC: THE STRAIGHT LINES

$$\begin{aligned} 1. \text{ a) } m &= \frac{12-2}{3-(-2)} \\ &= \frac{10}{2} \\ &= 2 \end{aligned}$$

$$\text{b) } y = 2x + c$$

$$\text{Point } (5, 5), \quad 5 = 2(5) + c$$

$$= 10 + c$$

$$c = -5$$

$$y = 2x - 5$$

$$\text{Equation of SRT is } y = 2x - 5$$

$$\begin{aligned} \text{c) } x - \text{intercept} &= -\left(\frac{-5}{2}\right) \\ &= \frac{5}{2} \end{aligned}$$

$$\begin{aligned} 2. \text{ a) Gradient} &= \frac{2-(-5)}{4-(-1)} \\ &= \frac{7}{5} \end{aligned}$$

$$\text{b) } y - \text{intercept} = 5$$

$$\begin{aligned} x - \text{intercept} &= -\frac{5}{7/5} \\ &= \frac{-25}{7} \end{aligned}$$

$$\text{Point E} = (-5, -2), \text{ gradient} = \frac{7}{5}$$

$$y = mx + c$$

$$-2 = mx + c$$

$$-2 = \frac{7}{5}(-5) + c$$

$$c = 5$$

$$y = \frac{7}{5}x + 5$$

$$3. \text{ a) The gradient} = \frac{2-p}{6-0}$$

$$-3 = \frac{2-p}{6}$$

$$-18 = 2 - p$$

$$p = 20$$

Coordinates of point T = (0, 20)

$$\text{b) } y = mx + c$$

$$m = -3, \quad c = 20$$

$$y = -3x + 20$$

$$c) 2y = \frac{1}{3}x + 18$$

$$y = \frac{1}{6}x + 9$$

The value of p = 9, gradient = $\frac{1}{6}$

$$4. a) m = \frac{6-3}{-1-4}$$
$$= -\frac{3}{5}$$

$$b) m = -\frac{3}{5}$$
$$-\frac{3}{5} = \frac{3-0}{4-q}$$

$$\begin{aligned} -3(4-q) &= 3(5) \\ -12 + 3q &= 15 \\ 3q &= 27 \\ q &= 9 \end{aligned}$$

$$c) D = (-1, 0), F = (4, 3)$$

$$m = \frac{3-0}{4-(-1)}$$
$$= \frac{3}{5}$$

$$5. a) \text{ Gradient} = \frac{0-(-8)}{0-(-4)}$$
$$= \frac{8}{4}$$
$$= 2$$

$$b) \text{ x-intercept} = -\frac{10}{2}$$
$$= -5$$

$$\begin{aligned} y &= mx + c \\ 6 &= 2(-2) + c \\ 6 &= -4 + c \\ c &= 10 \\ y &= 2x + 10 \end{aligned}$$

$$5. \text{ a) Gradient} = \frac{3-0}{5-0}$$

$$= \frac{3}{5}$$

$$\frac{z-4}{10} = \frac{3}{5}$$

$$5z - 20 = 30$$

$$5z = 50$$

$$z = 10$$

$$\text{c) } x\text{-intercept of line EF} = -\frac{\frac{26}{5}}{\frac{3}{5}}$$

$$= -\frac{26}{3}$$

$$\text{b) gradient} = \frac{3}{5}, \text{ E} = (-2, 4)$$

$$y = mx + c$$

$$4 = -\frac{6}{5} + c$$

$$c = \frac{26}{5}$$

$$\text{Equation of line EF is } y = \frac{3}{5}x + \frac{26}{5}$$

$$7. \text{ a) F} = (0,4), \text{ G} = (-4, 0)$$

$$\text{Gradient} = \frac{4-0}{0-(-4)}$$

$$= \frac{4}{4}$$

$$= 1$$

$$\text{b) } x\text{-intercept of HIJ} = -\left(\frac{-3}{5}\right)$$

$$= \frac{3}{5}$$

$$\text{c) } y = mx + c$$

$$y = 5x - 3$$

$$8. \text{ a) P} = (-8, 0), \text{ Q} = (-5, \frac{9}{4})$$

$$m = \frac{\frac{9}{4} - 0}{-5 - (-8)}$$

$$= \frac{\frac{9}{4}}{3}$$

$$= \frac{9}{4} \times \frac{1}{3}$$

$$= \frac{3}{4}$$

$$\text{b) Q} = (-5, \frac{9}{4}), \text{ gradient M} = \frac{3}{4}$$

$$y = mx + c$$

$$\frac{9}{4} = \frac{3}{4}(-5) + c$$

$$c = \frac{15}{4} + \frac{9}{4}$$

$$c = 6$$

$$y\text{-intercept} = 6$$

c) $R = (0, 6)$, $S = (6, 0)$

$$\begin{aligned} m &= \frac{0-6}{6-0} \\ &= \frac{-6}{6} \\ &= -1 \end{aligned}$$

9. a) i) Equation of LK is $x = 7$

$$\begin{aligned} \text{ii)} \quad y &= mx + c \\ 8 &= 2(-2) + c \\ 8 &= -4 + c \\ 12 &= c \end{aligned}$$

Equation of EFG is $y = 2x + 12$

$$\begin{aligned} \text{b) } m &= \frac{8-(-4)}{-2-7} \\ &= -\frac{12}{9} \\ &= -\frac{4}{3} \end{aligned}$$

$$y = mx + c$$

$$8 = -\frac{4}{3}(-2) + c$$

$$\frac{16}{3} = c$$

$$y = -\frac{4}{3}x + \frac{16}{3}$$

Coordinates of H = $(0, \frac{16}{3})$,

Coordinates of J is $(x, 0)$, $y = -\frac{4}{3}x + \frac{16}{3}$

$$-\frac{4}{3}x + \frac{16}{3} = 0$$

$$-4x + 16 = 0$$

$$-4x = -16$$

$$X = 4$$

Therefore coordinates of J = $(4, 0)$

$$\begin{aligned} 10 \text{ a). } 3y - 6x &= 3 \text{ -----(1)} \\ 4x &= y - 7 \\ y &= 4x + 7 \text{ -----(2)} \end{aligned}$$

Substitute (2) into (1)

$$\begin{aligned} 3(4x + 7) - 6x &= 3 \\ 12x + 21 - 6x &= 3 \\ 6x &= 3 - 21 \\ 6x &= -18 \\ x &= -3 \\ y &= 4(-3) + 7 \\ &= -12 + 7 \\ &= -5 \end{aligned}$$

Point of intersection is (-3, -5)

$$\begin{aligned} \text{b) } y &= \frac{2}{3}x + 3 \text{ -----(1)} \\ y &= \frac{4}{3}x + 1 \text{ -----(2)} \\ (1) &\text{ to } (2) \end{aligned}$$

$$\begin{aligned} \frac{2}{3}x + 3 &= \frac{4}{3}x + 1 \\ \frac{4}{3}x - \frac{2}{3}x &= 3 - 1 \\ \frac{2}{3}x &= 2 \\ x &= 3 \\ y &= \frac{2}{3}(3) + 3 \\ &= 2 + 3 \\ &= 5 \end{aligned}$$

Point of intersection is (3, 5)