EQUATIONS OF A S.LINE REVISION QUESTIONS

QUESTION 1

A line L passes through (-2, 3) and (-1, 6) and is perpendicular to a line P at (-1, 6).

(a) Find the equation of L

(b) Find the equation of P in the form ax + by = c,where a, b and c are constants.

(c) Given that another line Q is parallel to L and passes through point (1, 2)

find the x and y intercepts of Q

(d) Find the point of the intersection of lines P and Q

QUESTION 2

(a) A straight line L, whose equation is 3y – 2x = –2 meets the x-axis at R. Determine the co-ordinates of R.

b) A second line L2 is perpendicular to L1 at R. Find the equation of L2 in the form y = mx + c, where m and c are constants.

(c) A third line L3 passes through (–4,1) and is parallel to L2 Find:

(i) the equation of L3 in the form y = mx + c, where m and c are constants

(ii) the co-ordinates of point S, at which L intersects L

QUESTION 3

A line with gradient of -3 passes through the points (3. k) and (k.8). Find the value of k and hence express the equation of the line in the form a ax + ab = c, where a, b, and c are constants.

QUESTION 4

The data given below represents the average monthly expenditure, E in K £, on food in a certain village. The expenditure varies with number of dependents, D in the family

Dependants	3	7	12	25	32
Expenditure E (K£)	-210	250	305	440	500

(a) Using the grid provided, plot E against D and draw the line of the best fit (2 marks)
(b) Find the gradient and the E- intercept of the graph (3 marks)
(c) Write down an equation connecting E and D (1 mark)
(d) Estimate the cost of feeding a family with 9 dependants (2 marks)

QUESTION 5

A straight line L1 has a gradient ¯½ and passes through point P (-1, 3). Another line L2 passes through the points Q (1, -3) and R (4, 5). Find.

(a) The equation of L1. (2mks)

(b) The gradient of L2. (1mk)

(c) The equation of L2. (2mks)

(d) The equation of a line passing through a point S (0, 5) and is perpendicular to L2. (3mks)

EQUATIONS OF A S.LINE REVISION QUESTIONS MS

QUESTION 1

(a) Equation of L

$$\text{gradient} = \frac{6-3}{-1-^{-}2}$$

$$= 3$$

$$\text{equation} = \frac{y-6}{x+1} = 3$$

$$\Rightarrow y - 3x = 9$$

(b) equation of P

$$= \frac{y-6}{x+1} = -\frac{1}{3}$$

$$3y + x = 17$$

(c) equation of Q

$$= \frac{y-2}{x-1} = 3$$

$y = 3x - 1$ B1

x intercept

when $y = 0 \Rightarrow x = \frac{1}{3}$ B1

y intercept

when $x = 0 \Rightarrow y = -1$ B1

(d) Intersection of lines P and Q

$3y + x = 17 .. (i)$

$y - 3x = -1 .. (ii)$ M1

$3y + x = 17$

$3y - 9x = -3$

$10x = 20 \Rightarrow x = 2$ A1 for both $x = 2$ and $y = 5$

subset $3y + 2 = 17 \Rightarrow y = 5$

$\therefore$ point of intersection $(2, 5)$ B1

10

QUESTION 2

(a) At x-axis $y = 0 \Rightarrow x = 1$ M1

coordinates of R is (1,0) A1

(b) Gradient of $L_1 = \frac{2}{3}$; Grad $L_2 = \frac{-3}{2}$ B1

Equation of L_2: $\frac{y-0}{x-1} = \frac{-3}{2}$ M1

$$y = -\frac{3}{2}x + 1\frac{1}{2}$$ A1

(c) (i) Equation L_3: $\frac{y-1}{x+4} = \frac{2}{3}$ M1

$3y - 3 = 2x + 8$

$\Rightarrow y = \frac{2}{3}x + 3\frac{2}{3}$ A1

(ii) $\frac{2}{3}x + 3\frac{2}{3} = \frac{-3}{2}x + \frac{3}{2}$ M1

$\frac{2}{3}x + \frac{3}{2}x = \frac{3}{2} - \frac{11}{3}$

$13x = -13 \Rightarrow x = -1$

subst for y: $y = \frac{2}{3}(-1) + \frac{11}{3}$ M1

$= \frac{-2}{3} + \frac{11}{3} = 3$

coordinates of S (-1,3) A1

QUESTION 3

$\frac{k-8}{3-k} = -3 \quad k = 1/2 \quad \frac{y-8}{x-1/2} = -3$ M1 B1 A1

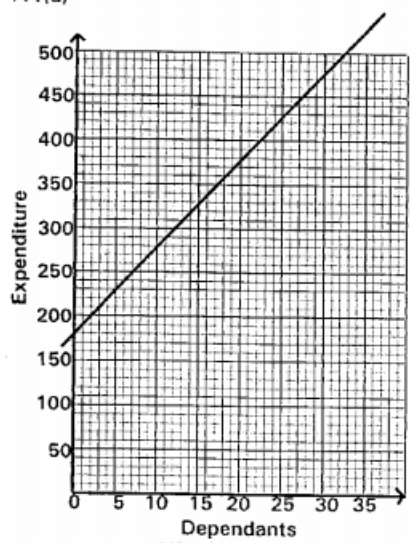
$\frac{8-k}{k-3} = -3$

$6x + 2y = 19$

$3x + y = 9\frac{1}{2}$

QUESTION 4

17.(a)



(b) gradient $= \frac{440-305}{25-12} = 10\frac{5}{13} = 10.385$

(c) $e = \frac{135}{13}d + 175$

(d) $E = \frac{135}{13}(9) + 175 = 268.46$

QUESTION 5

(a)

$\frac{y-3}{x+1} = \frac{1}{2}$ M1

$y-3 = -\frac{1}{2}x - \frac{1}{2}$

$y = -\frac{1}{2}x + \frac{5}{2}$ A1

(b)

$g = \frac{5--3}{4-1}$

$= \frac{8}{3}$ A1

(c)

$\frac{y-5}{x-4} = \frac{8}{3}$ M1

$y-5 = \frac{8}{3}x - \frac{32}{3}$ M1

$y = \frac{8}{3}x - \frac{32}{3} + 5$

$y = \frac{8}{3}x - \frac{17}{3}$ A1

(d)

$\frac{y-5}{x} x - \frac{3}{8}$ M1

$y = \frac{-3}{8}x + 5$ A1

(e)

$\frac{y-5}{x-4} = -\frac{1}{2}$ M1

A1

$y-5 = -\frac{1}{2}x + 2$

$y = -\frac{1}{2}x + 7$