# 1. Equations of straight lines

1. If the equation $RV = 3.2 + \frac{1}{4}V$, where R and V are variables, is re-arranged in form

   $y = mx + c$, determine the gradient and the y-intercept of the line drawn. (3 mks)

2. A straight line passes through A(-2,1) and B(2,-k). The line is perpendicular to a line 3y + 2x = 5.

   Determine the value of k. (3mks)

3. A line whose gradient is positive is drawn on the Cartesian plane and its equation is $x - y\sqrt{3} = -3$.

   Calculate the angle formed between the line and X axis. (3mks)

4. A straight line L_1 passes through P(2,1) and is perpendicular to straight line L_2, whose equation is 2y − x + 4 = 0. Find the equation of L_1. (3 marks)

5. Find the equation of a line passing through point (-3, 5) and perpendicular to the line 2y

   + x − 3 = 0, answer in the form of ay + bx + c = 0 (3mks)

6. A straight line through the points A(2,1) and B(4,m) is perpendicular to the line whose equation is 3y = 5 − 2x. Determine the value of m and the equation of line AB (4mks)

7. The straight line passing through the point (-3,-4) is perpendicular to the line whose

   equation is 2y+3x=1 and intersect the x-axis and y-axis at points P and Q respectively.

   Find the length of PQ. (4mks)

8. The gradient of a line L through points A(2x,4) and B(-1,x) is $^1/_7$. Find the equation of a line perpendicular to L through B. (3 marks)

9. A triangle has vertices A(2,5), B(1,2) and C(-5,1). Determine:

   (i) The equation of line BC. (2mks)

   (ii) The equation of the perpendicular from A to BC. (1mk)

10. The line y = 3x + 3 meets the line L_1 at the point (2, 9) and at a right angle.

    (a) Find the points at which the two lines intersect with the x − axis. (3mks)

    (b) Hence calculate the area bound by the two lines and the x − axis. (1mk)

11. A line with gradient -3 passes through the points (3, k) and (k, 8). Find the value of K and hence express the equation in the form ax + by = c where a, b and c are constants. (4 mks)

12. The straight line through the points D (6,3) and E (3, -2) meets the y − axis at point F. Find the co-

    ordinates of F (3 mks)

13. Find the obtuse angle the line y − 2x = 7 makes with the x − axis (2 mks)

14. The figure below shows a sketch a of a line 5y-3x = 15
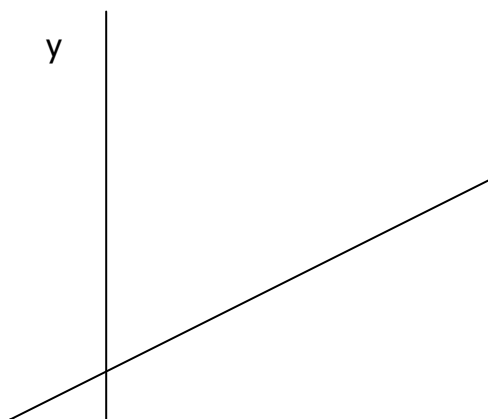
Ø

X

Find the value of Ø   (3 marks)

15.   A solid right pyramid has a rectangular base 10cm by 8cm and slanting edge 16cm.
        calculate:
        (a) The vertical height
        (b) The total surface area
        (c) The volume of the pyramid

16.   The line passing through the points A (-1, 3K) and B (K, 3) is parallel to the line whose
        equation is $2y + 3x = 9$. Write down the co-ordinates of A and B

17.   Find the value of **a** if the gradient of the graphs of the function $y = x^2 - x^3$ and $y = x - ax$
        are equal at $x = \frac{1}{3}$

18.   Two perpendicular lines meet at the point (4,5). If one of the lines passes through
        the point (-2,1), determine the equation of the second line in the form ax + by + c =0.

19.   Find the equation of the line passing through (-5, 2) and with X-intercept as 3. Leave your answer
        in the form of $\mathbf{Y = mX + C}$

20.   (a) copy and complete the table below:

x	0	1	2	3	4	5	6
$y = 2x - 4$							
$y = 12 - 2x$							

        (b) (i) On the grid provided and using the same axes, draw the lines y = 2x + 4 and y = 12 – 2x
            (ii) Hence use your graphs to solve the simultaneous equations
                ½ x – ¼ y = 1
                x + ½ y = 6
        (c) By use of substitution method, solve the simultaneous equations;
                6x + 4y = 36
                x + 3y = 13

21.   Find the equation of a line through point   -2, 4   which is parallel to 3y =- 2x + 8.
        Express your answer in the form y = [mx + c]

22.   Determine the equation of a line passing through (-1, 3) and parallel to the line whose
        equation is 3x -5y = 10

23.   On a certain map, a road 20km long is represented by a line 4cm long. Calculate the area
        of a rectangular plot represented by dimensions 2.4cm by 1.5cm on this map – leaving
        your answer in hectares

24.   A straight line passing through point (-3,4) is perpendicular to the line whose equation is
        2y-5x=11 and intersects the x-axis and y-axis at the points P and Q respectively. Find the
        co-ordinates of P and Q

25.   A triangle ABC is formed by the points A(3, 4), B(-7, 2) and C(1, -2)
        (a) Find the co-ordinates of the mid-points K of AB and P of AC

(b) Find the equation of the perpendicular bisector of the KP

26. The equation of line L_1 is $^{-3}/_5 x + 3y = 6$. Find the equation of a line L_2 passing through point T (1, 2) and perpendicular to line L_1

27. Determine the equation of a line passing through (-1, 3) and parallel to the line whose equation is $3x - 5y = 10$

28. A straight line through the points A (2, 1) and B (4, m) is perpendicular to the line, whose equation is $3y = 5-2x$. Determine the value of **m**

29. Determine the equation of a line which is perpendicular to the line $2x + 3y + 4 = 0$ and passes through P(1,1)

30. Koech bought 144 pineapples at shs.100 for every six pineapples. She sold some of them at shs.72 for every three and the rest at shs.60 for every two. If she made a profit of 40%; Calculate the number of pineapples sold at 72 for every three

31. Solve the equation $\dfrac{x + 2}{3} - \dfrac{x - 1}{2} = 5$