# FORM FOUR CLUSTER KCSE MODEL13

# MATHEMATICS PAPER 1 QUESTIONS

## SECTION A (50 Marks)

**Answer all questions in this section.**

1. Evaluate without using tables or a calculator: (3mrks)

$$\frac{\frac{6}{7}\ of\ 14 \div 80 \times \frac{-20}{3}}{-2 \times 5 + (14 \div 7) \times 3}$$

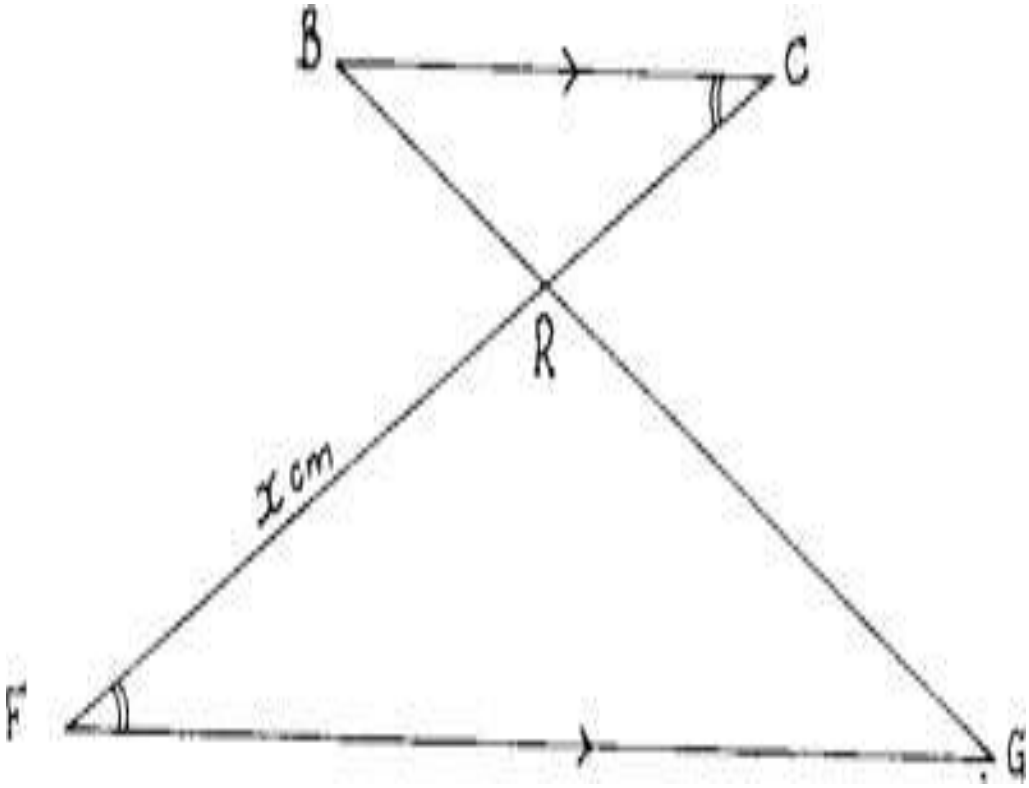
2. Factorise $x^2 - y^2$

   Hence find the exact value of $2557^2 - 2547^2$

3. Two lines L1 and L2 intersect at a point P. L1 passes through the points (-4,0) and (0,6). Given that L2 has the equation $y = 2x - 2$, find by calculation, the co-ordinates of P. (4marks)

4. 4. The volume of a right pyramid with a square base is 256cm2. If its height is 16cm, calculate the side of the square base. (3marks)

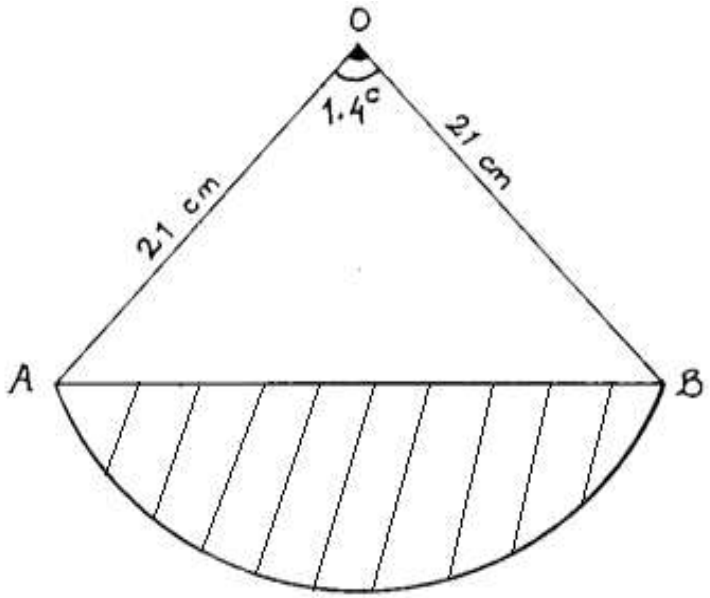
5. In the figure below, BC is parallel to FG and the lines BG and FC meet at R.




Given that BR: RG =4 : 6 and FG =30cm, find the length FR. (3marks)

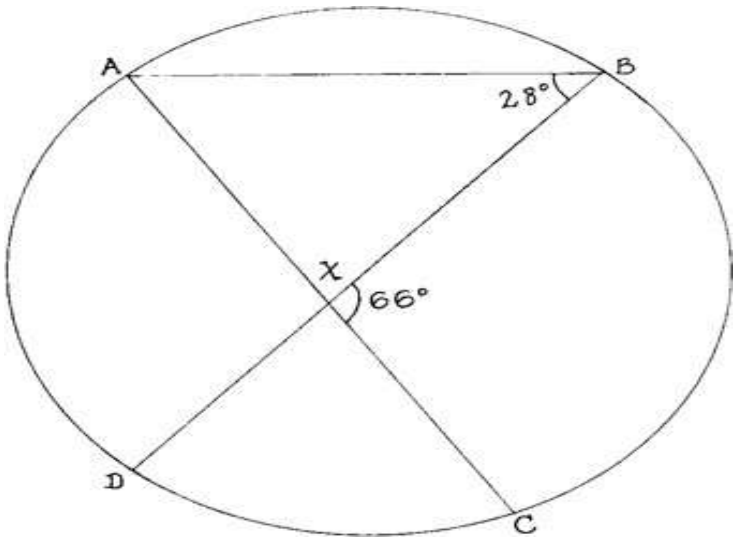
6. Given that $\frac{2x+3y}{3x+4y}=5$, find the ratio **y : x**

7. The figure below shows a sector of a circle radius 21cm. Given that the angle BOA= 1.4c, calculate the area of the shaded region correct to 2 decimal places. (3marks)




8. The size of an interior angle of a regular polygon is 3x while its corresponding exterior angle is (x-20). Find the number of sides of the polygon. (3marks)

9. O is the centre of the circle and DOB is a diameter. A, B, C and D lie on the circumference of the circle.




Angle ABD =280 and angle BXC = 660, calculate angle CDB (2marks)

10. The perimeter of a right angle triangle is 36cm. Find the length of the other two sides if its hypotenuse is 15cm. (4marks)

11. Find the value of **x** in the following

$$16^{x^2} = 8^{4x-3}$$

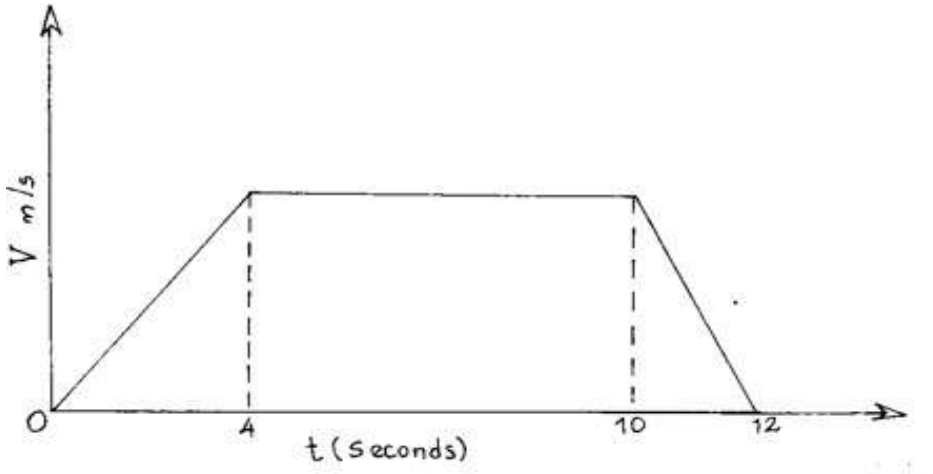
(3marks)

12. Using a ruler and a pair of compasses;

    (a) Construct triangle ABC in which BC =8cm, angle ABC=1050 and angle BAC =450. (2marks)

    b) Drop a perpendicular from A to meet CB produced at P. Hence find the area of triangle ABC. (2marks)

13. The figure below shows the graph of velocity Vm/s against time t seconds of a car. If the car travelled a distance of 32metres in the first four seconds, calculate the average velocity for the whole journey. (3marks)




14. . The monthly salaries of two men are in the ratio 3 : 2 and their expenditures are in the ratio 8 : 5. Each man saves Ksh 500 every month. Find their monthly salaries. (4marks)

15. The price an article was raised by 20% and a week later the new price was lowered by 20%. What was the new price if the original price was ksh.50 (2marks)

16. A forex bureau in Kenya buys and sells foreign currencies as shown below.

| Currency | Buying (Ksh) | Selling (Ksh) |
|---|---|---|
| Chinese Yen | 12.34 | 12.38 |
| South Africa Rand | 11.28 | 11.37 |

A business woman from China converted 195 250 Chinese Yen into Ksh. a) Calculate the amount of money in Ksh. she received. (1mark)

b) While in Kenya, the business woman spend Ksh. 1,25,8000 and then converted the balance into South African Rand. Calculate the amount of money to the nearest rand that she received. (2marks)

## SECTION B (50 Marks)

**Answer only five questions in this section in the spaces provided below each question.**

17. In the year 2010, the price of a sofa set was Ksh 12,000.

    a) Calculate the amount of money received from the sale of 240 sofa sets that year. (2marks)

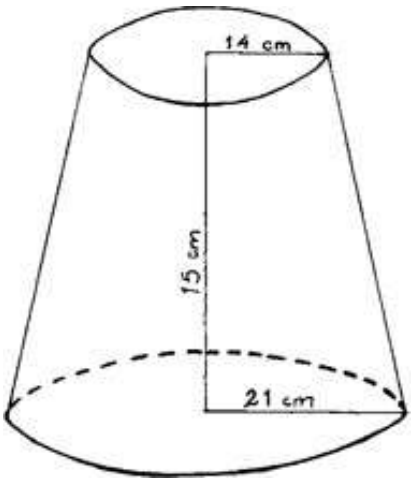
    b) (i) In the year 2011, the price of each sofa set increased by 25% while the number of sets sold decreased by 10%. Calculate the percentage increase in the amount received from the sales. (4marks)

    ii) If at the end of 2011, the price of each sofa set changed in the ratio 16 : 15, calculate the price of each sofa set in the year 2012. (1mark)

    c) The number of sofa sets sold in the year 2012 was x% less than the number sold in the year 2010. Calculate the value of x, given that the amounts received from sales of the two years were equal. (3marks)

18. The diagram below represents a solid frustrum with base radius 21cm and top radius 14cm.

    The height of the frustrum is 15cm and is made of a metal material whose density is 2g/cm3.




    Calculate: a)

    i) The volume of the metal in the frustrum. (5marks)

    ii) The mass of the frustrum in kg. (2marks)

    b) The frustum is melted and recast into a solid sphere, in the process, 20% of the metal is lost. Calculate to 1 decimal place the radius of the sphere. (3marks)

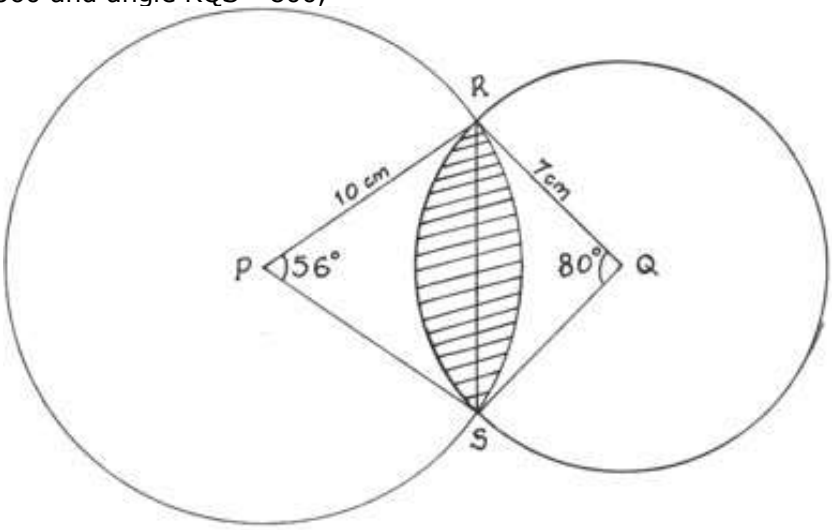
19. . A lorry travels from Nairobi to Bungoma and back. From Nairobi to Bungoma, the average speed of the lorry is 70km/h and from Bungoma to Nairobi, the lorry averages 20km/h slower and takes 4hours longer than on the journey from Nairobi to Bungoma.

    a) Find the distance between Nairobi and Bungoma. (4marks)

    b) Diesel consumption is 0.32 litres per kilometer on the journey from Nairobi to Bungoma. This rate of fuel consumption increases by 25% on the return journey. Calculate the amount of diesel the lorry consumes for the trip. (3marks)

    The lorry makes 2 round trips per week. If diesel costs sh105 per litre, determine the total cost of diesel required to run the lorry for three months. (3marks)

20.The two circle intersect at R as S so that they have a common chord RS. Given that angle RPS= 560 and angle RQS =800,




Calculate to 2 decimal places the area of:

$\left(Take\ \pi = \frac{22}{7}\right)$. Take .

a) Sectors RPS and RQS. (3marks)
b) Triangles RPS and RQS (3marks)
c) The shaded region. (4marks)

21A man standing on top of a building observes two cars A and B on the same horizontal road. The angle of depression for car B which is nearer the foot of the building is 470, while that for car A is 250. If the distance between the cars is 45m and that between car B and the foot of the buildings is y metres.

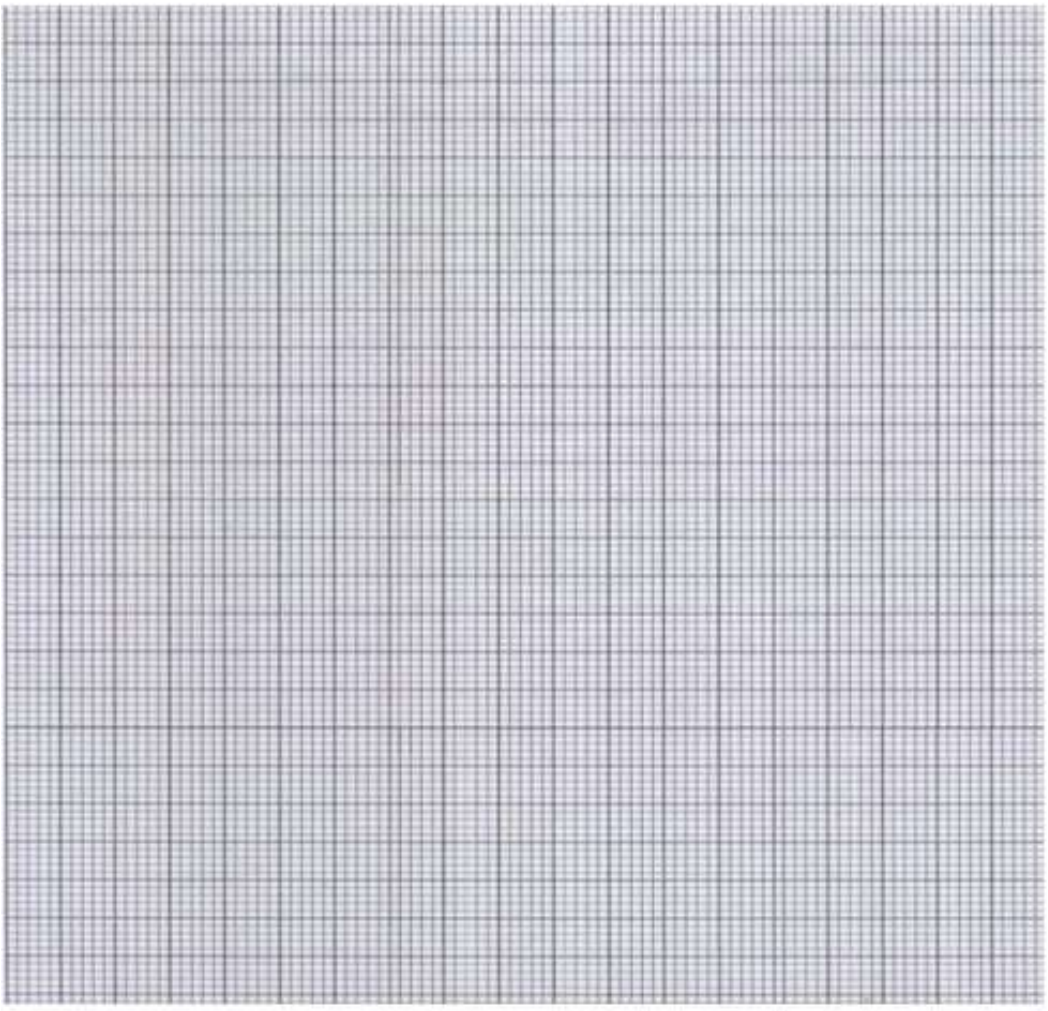
a) Form two expressions for the height of the building. (3marks)

b) Calculate the height of the building. (4marks)
c) Find the difference in the distance between the top of the building and cars A and B. (3marks)

22.. The frequency table below shows the daily wages paid to casual workers by Nzoia Sugar Company.

| Wages (Ksh) | 100 -150 | 150 - 200 | 200 -300 | 300 - 400 | 400 - 600 |
|---|---|---|---|---|---|
| No. of workers | 160 | 120 | 380 | 240 | 100 |

a) Draw a histogram to represent the above information. (5 marks)



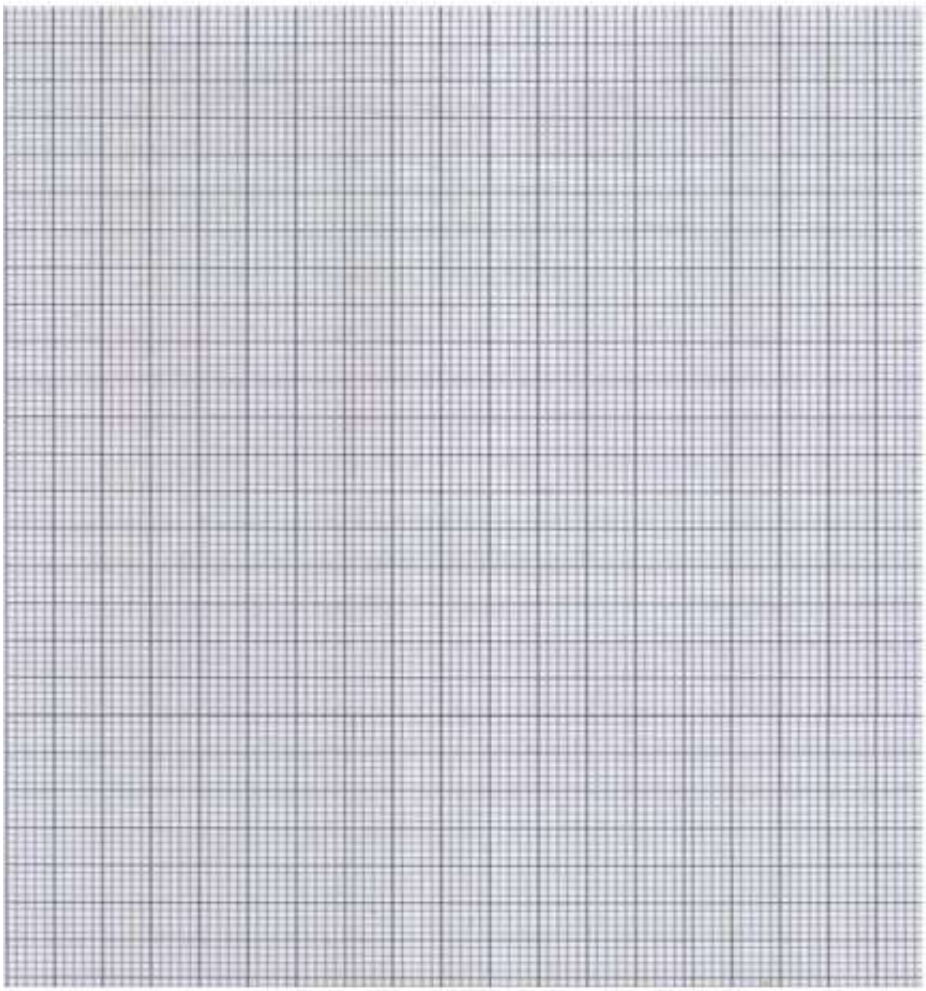
b) i) State the class in which the median wage lies. (1mark)

ii) Draw a vertical line, in the histogram showing where the median wage lies. (1mark)

c) Using the histogram, determine the number of workers who earn Shs. 450 or less per day. (3marks)

23. The vertices of triangle PQR are P(-2,3) Q(1,2) and R(4,3) a) Plot $\Delta PQR$ PQR on the grid provided below (2marks)

a) Plot $\Delta PQR$ on the grid provided below



b) $\Delta P^1Q^1R^1$ is the image of $\Delta PQR$ under a reflection in the line $x = 0$.
State the co-ordinates of $P^1Q^1$ and $R^1$ and plot $\Delta P^1Q^1R^1$. (3marks)

c) $\Delta P^{11}Q^{11}R^{11}$ is the image of $\Delta P^1Q^1R^1$ under a rotation of half turn about point (0, 1).
State the co-ordinates of $P^{11}Q^{11}$ and $R^{11}$ and plot $\Delta P^{11}Q^{11}R^{11}$. (3marks)

24.a) Using a ruler and compasses only, construct triangle ABC in which BC = AC = 6cm and angle ACB =1350. (3marks)

b) Measure AB (1 mark)

c) From A drop a perpendicular to meet BC produced at D. (1mark)

d) Measure AD and hence calculate the area of triangle ABC. (2marks)

e) Mark a point P on AD such that the area of triangle PBC is half the area of a triangle ABC. (1mark)

f) Complete triangle PBC and measure angle PBC. (2marks)