

FORM FOUR CLUSTER KCSE MODEL6

MATHEMATICS PAPER 1 QUESTIONS

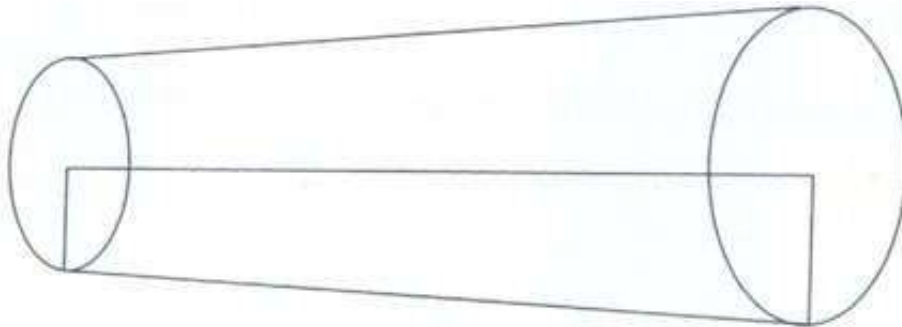
SECTION 1 (50 Marks)

ANSWER ALL QUESTIONS

1. Without using a calculator or a mathematical table evaluate:

$$\frac{2\frac{1}{5} + \frac{2}{3} \text{ of } 3\frac{3}{4} - 4\frac{1}{6}}{1\frac{1}{4} - 2\frac{2}{5} \div 1\frac{1}{3} + 3\frac{3}{4}}$$

2. A straight line passes through the point $(-3, -4)$ and is perpendicular to the line whose equation is $3x + 2y = 11$ and intersects the x-axis and y-axis at points A and B respectively. Find the length of AB.
3. Given the inequalities
- $$-5 \leq 3x - 8 < 2x - 3$$
- a) Solve the inequalities. (2marks)
- b) Represent the solution on a number line. (1mark)
4. A translation vector maps P $(3, 4)$ onto P' $(8, -1)$. Find the coordinates of A $(-2, 7)$ under the same translation.
5. A pulley is made up of two wheels of radii 6cm and 9cm respectively and the distance between their centre is 18cm.



If a belt passes round the two pulleys, find its length. (4marks)

6. Using tables evaluate. (3marks)

$$\frac{1}{34.52} + \sqrt[3]{0.787} + (0.934)^3$$

7. Solve for y in the equation $8^{(2-y)} \times 32 = 16^{(y+1)}$
8. Find value of x in $\sqrt{x} + \sqrt{x+9} = 9$
9. Kamande's salary increased from kshs. 45,000 to 65,000 in the month of August. State the ratio in which it changed. What was the percentage in his salary? Leave your answer in 2sf.

The GCD and LCM of three numbers are 3 and 1008 respectively. If two of the numbers are 48 and 72 respectively find the least possible value of the third number.

10. . If $\tan x = \frac{4}{3}$ find the value of $\sin 2x + \cos x$ without using tables or calculator.

11. . The area of a rhombus is 60cm^2 . Given that one of its diagonals is 15m long, calculate the perimeter of the rhombus.

12. Two parallel chords of length 8cm and 10cm have the perpendicular distance between them as 2cm. Find the radius of the circle correct to 1dp.

13. Solve for y in

$$\log y^4 + \log 4^y = 2.5$$

14. A line segment joining two points P(0,7) and S(2,3.8) is divided externally by point Q in the ratio 7:3, find the coordinates of Q.

15. Solve the simultaneous equations below.

$$12x + 12y + 7 = 0$$

$$4x - 3y - 7 = 0$$

SECTION 2 (50 Marks)

ANSWER ANY FIVE (5) QUESTIONS IN THIS SECTION

16. . Matrix P is given by $\begin{bmatrix} 4 & 7 \\ 5 & 8 \end{bmatrix}$

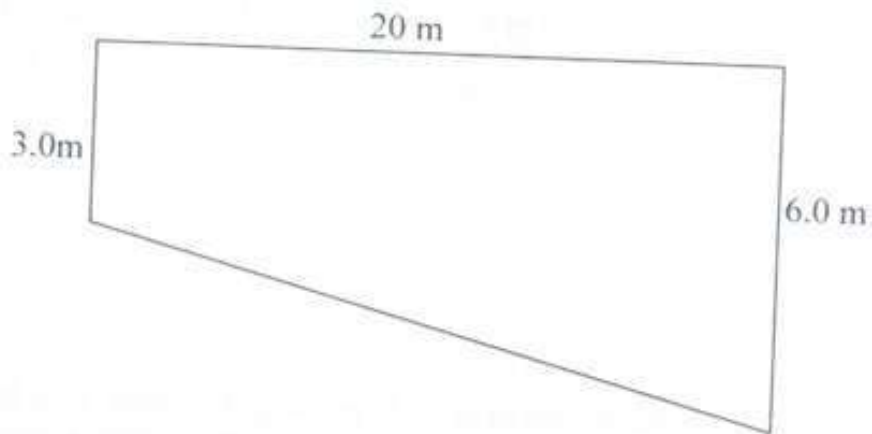
a) Find the inverse of P (2marks)

b) Two schools Mwihi and Namasoli purchased beans at sh. B per bag and maize at sh. M per bag. Mwihi purchased 8 bags of beans and 14 bags of maize for shs. 47600. Namasoli purchased 10 bags of beans and 16 bags of maize for shs. 57400. i. Form a matrix equation to represent the information. (2marks)

ii. Use the inverse matrix of P to find the prices of one bag of each item. (4marks)

c) The price of beans later increased by 5% and that of maize remained constant. Mwihi bought the same quantity of beans but spent the same quantity of beans but spent same total amount of money as before on the two items. State the new ratio of beans to maize. (2marks)

17. The figure below shows a uniform cross-section of a pool which is 10m wide.



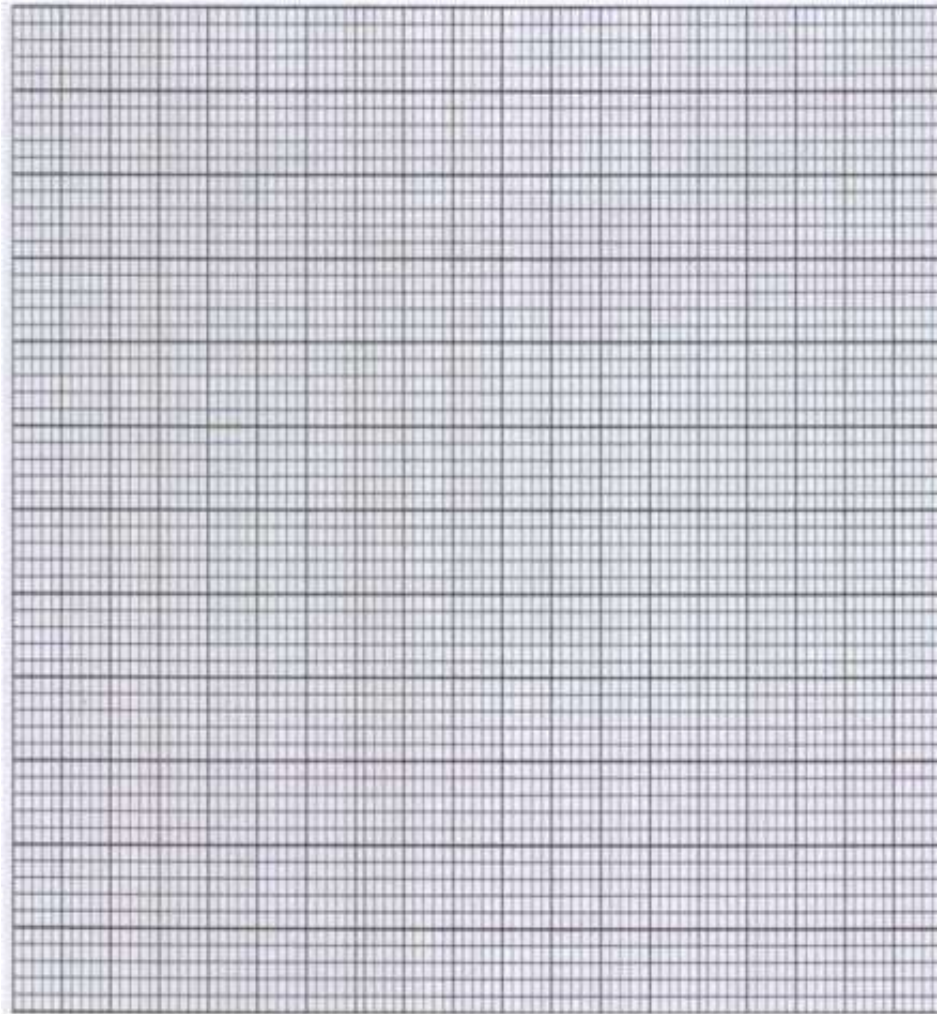
The depth of the pool increases gently from 3.0m to 6.0m.

- a) How much water in litres does it hold when full? (3marks)
- b) Calculate the total internal surface area of the pool. (5marks)
- c) Find the angle at which the bottom of the pool inclines to the horizontal. (2marks)

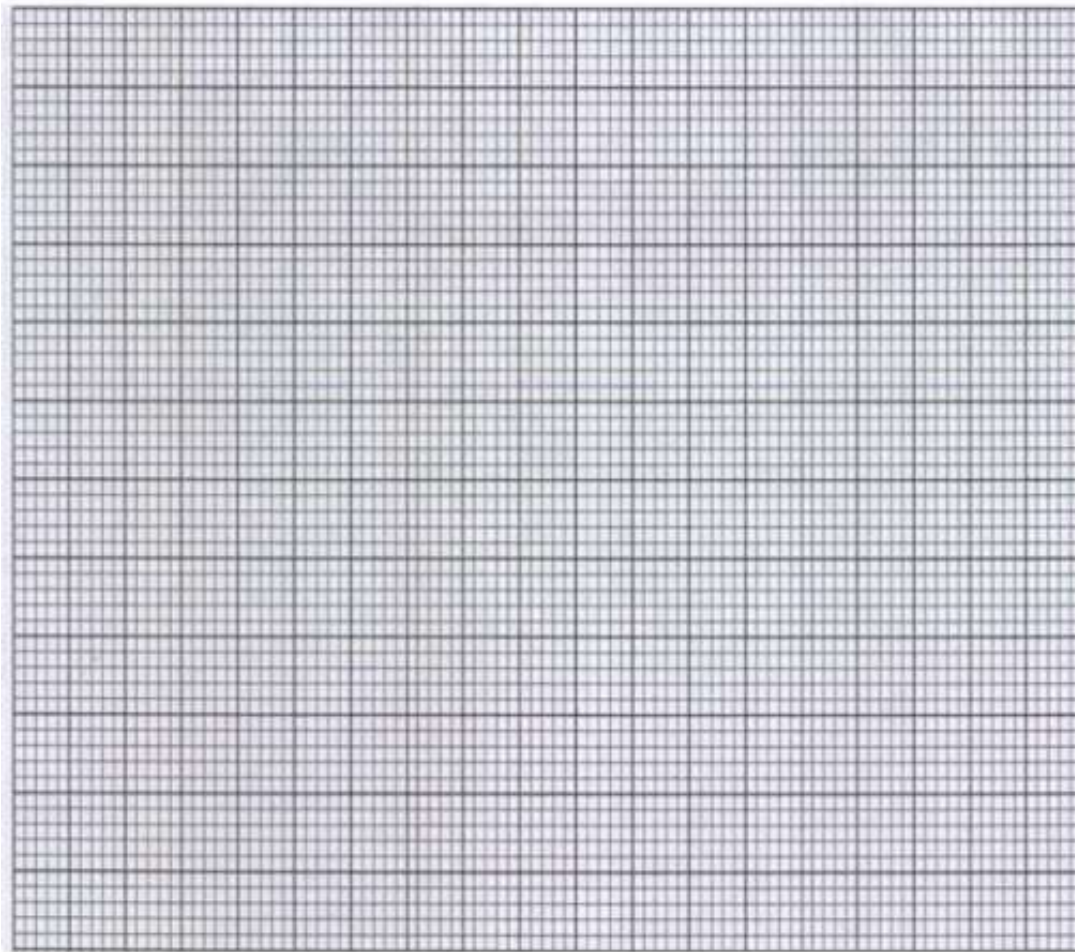
18. The table shows the marks obtained by 40 candidates in an examination.

Marks	5-14	15-29	30-34	35-44	45-49
Frequency	2	12	7	15	X

- a) Find the value of X (2marks)
- b) On the grid provided below draw a histogram to represent the data. (5marks)



- c) By drawing a straight line on the graph above determine the median. (3marks)
19. A car leaves Nakuru to Nyahururu 120km away at an average speed of 80km/hr at 8.30am at the same time a bus leaves Nyahururu for Nakuru at an average speed of 60km/hr at 8.45am a cyclist leaves Nyahururu for Nakuru at an average speed of 30km/hr
- . a) Calculate the time when the bus meets the car to nearest minute. (3marks)
 - b) Calculate the distance between the car and the bus by the time the cyclist meets the car. (4marks)
 - c) If the bus upon reaching Nakuru stops for 10 minutes then starts its journey back to Nyahururu, calculate how far from Nakuru the bus meets the cyclist. (3marks)
20. . a) Draw the graph of the function $y=2x^2-7x-2$ for $-1 < x < 6$ (5marks)



b) From your graph determine the roots of the $2x^2-7x-2=0$ (1mark)

c) By drawing a suitable graph of function $y = 2x-7$ on the same axis, solve the simultaneous equations $y=2x^2-7x-2$ and $y = 2x-7$ (4marks)

21. A parallelogram

OACB is such that $\underline{OA} = \underline{a}$, $\underline{OB} = \underline{b}$, D is the midpoint of BC. $\underline{OE} = h \underline{OC}$ and

$$AE = kAD.$$

a) Express the following vectors in terms of a , b , h and k

i) \vec{OC}

(1mark)

ii) \vec{OE}

(1mark)

iii) \vec{AD}

(1mark)

iv) \vec{AE}

(1mark)

b) Find the values of h and k .

(4marks)

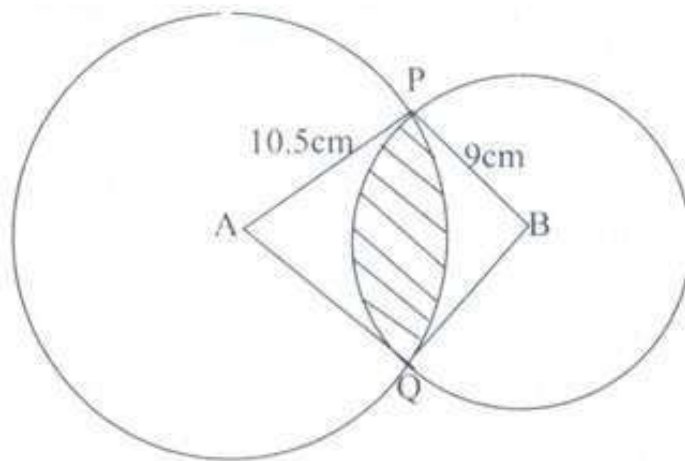
22. Four towns P, R, T and S are such that R is 80km directly to the north of P and T is on a bearing of 290° from P at a distance of 30 km. Using a scale of 1cm to represent 10km, make an accurate scale drawing to show the relative position of the towns. (4marks)

Find: a) The distance and the bearing of R from T. (3marks)

b) The distance and the bearing of S from R. (2marks)

c) The bearing of P from S. (1mark)

23. The figure below shows two circles of radii 10.5cm and 8.4cm and with centers A and B respectively. The common chord PQ = 9cm.



- a) Calculate angle $\angle PAQ$. (2marks)
- b) Calculate angle $\angle PBQ$ (2marks)
- c) Calculate the area of shaded part. (6marks)