

**MATHEMATICS PAPER 1 K.C.S.E 1995 QUESTIONS**  
**SECTION 1 (52 MARKS)**

*Answer all the questions in this section*

1. Without using logarithms tables evaluate ( 3 marks)

$$\sqrt{\frac{384.16 \times 0.0625}{96.04}}$$

2. Simplify ( 3 marks)

$$\frac{2x - 2}{6x^2 - x - 12} \div \frac{x - 1}{2x - 3}$$

3. Every week the number of absentees in a school was recorded. This was done for 39 weeks these observations were tabulated as shown below

Number of absentees	0.3	4 -7	8 -11	12 -	16 -	20 -
(Number of weeks)	6	9	8	11	3	2

Estimate the median absentee rate per week in the school ( 2 marks)

4. Manyatta village is 74 km North West of Nyangata village. Chamwe village is 42 km west of Nyangate. By using an appropriate scale drawing, find the bearing of Chamwe from Manyatta ( 2 marks)

5. A perpendicular to the line  $-4x + 3 = 0$  passes through the point ( 8, 5) Determine its equation ( 2 marks)

6. The volume  $V\text{cm}^3$  of an object is given by

$$V = \frac{2}{3} \pi r^3 \left( \frac{1}{sc^2} \right)^2$$

Express in term of  $\pi$ ,  $r$ ,  $s$  and  $V$  ( 3 marks)

8. Two baskets A and B each contains a mixture of oranges and lemons. Basket A contains 26 oranges and 13 lemons. Basket B contains 18 oranges and 15 lemons. A child selected basket at random and picked at random a fruit from it.

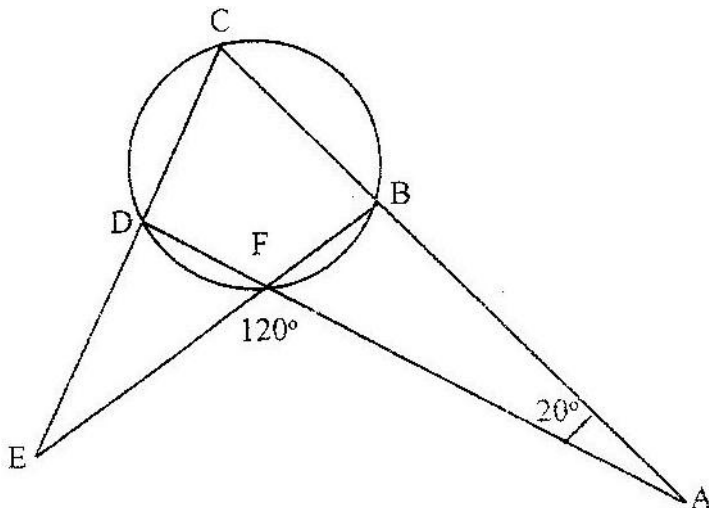
Determine the probability that the fruit picked was an orange.

9. A solid cone of height 12cm and radius 9 cm is recast into a solid sphere. Calculate the surface area of the sphere. ( 4 marks)

10. The first, the third and the seventh terms of an increasing arithmetic progression are three consecutive terms of a geometric progression. In the first term of the arithmetic progression is 10 find the common difference of

the arithmetic progression ( 4 marks)

11. Akinyi bought maize and beans from a wholesaler. She then mixed the maize and beans the ratio 4:3 she brought the maize at Kshs. 12 per kg and the beans 4 per kg. If she was to make a profit of 30% what should be the selling price of 1 kg of the mixture? ( 4 marks)
12. A clothes dealer sold 3 shirts and 2 trousers for Kshs. 840 and 4 shirts and 5 trousers for Kshs 1680. Form a matrix equation to represent the above information. Hence find the cost of 1 shirt and the cost of 1 trouser. ( 4 marks)
13. Water flows from a tap. At the rate  $27\text{cm}^3$  per second, into a rectangular container of length 60cm, breadth 30 cm and height 40 cm. If at 6.00 p.m. the container was half full, what will be the height of water at 6.04 pm? ( 3 marks)
14. In the diagram below  $\angle CAD = 20^\circ$ ,  $\angle AFE = 120^\circ$  and BCDF is a cyclic quadrilateral. Find  $\angle FED$ . ( 3 marks)

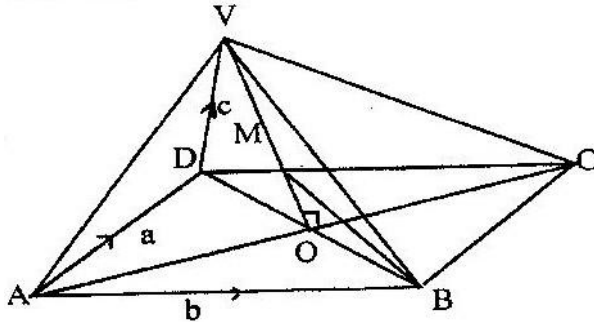


15. The cash price of a television is Kshs 25000. A customer paid a deposit of Kshs 3750. He repaid the amount owing in 24 equal monthly installments. If he was charged simple interest at the rate of 40% p.a, how much was each installment? ( 4 marks)
16. A bus takes 195 minutes to travel a distance of  $(2x + 30)$  km at an average speed of  $(x - 20)$  km/h. Calculate the actual distance traveled. Give your answers in kilometers. ( 3 marks)

**SECTION II ( 48 MARKS)**  
**Answer any six questions from this section**

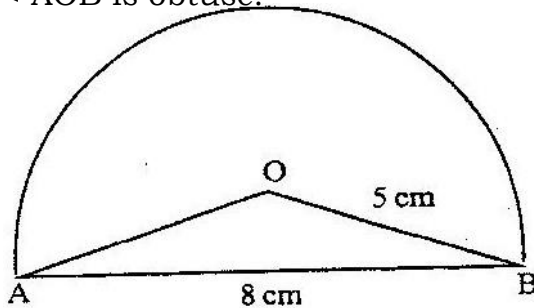
17. At the beginning of every year, a man deposited Kshs 10,000 in a financial institution which paid compound interest at the rate of 20% p.a. He stopped further deposits after three years. The Money remained invested in the financial institution for a further eight years.
- (a) How much money did he have at the end of the first three years ( 4 marks)
- (b) How much interest did the money generate in the entire period ( 4 marks)

18. The figure below is a right pyramid with a rectangular base ABCD and VO as the height. The vectors  $AD = a$ ,  $AB = b$  and  $DV = v$



- a) Express
- (i)  $AV$  in terms of  $a$  and  $c$  ( 1 mark)
- (ii)  $BV$  in terms of  $a$ ,  $b$  and  $c$  ( 2 marks)
- (b)  $M$  is point on  $OV$  such that  $OM: MV = 3:4$ , Express  $BM$  in terms of  $a$ ,  $b$  and  $c$ .  
 Simplify your answer as far as possible ( 5 marks)

19. (a) In the figure below  $O$  is the centre of a circle whose radius is 5 cm  $AB = 8$  cm and  $\angle AOB$  is obtuse.



- Calculate the area of the major segment ( 6 marks)
- (b) A wheel rotates at 300 revolutions per minute. Calculate the angle in radians through which a point on the wheel turns in one second.

20. The table shows the height metres of an object thrown vertically upwards varies with the time  $t$  seconds  
 The relationship between  $s$  and  $t$  is represented by the equations  $s = at^2 + bt + 10$  where  $b$  are constants.

t	0	1	2	3	4	5	6	7	8	9	10
s		45.1									

(a) (i) Using the information in the table, determine the values of a and b ( 2 marks)

(ii) Complete the table ( 1 mark)

(b) (i) Draw a graph to represent the relationship between s and t ( 3 marks)

(ii) Using the graph determine the velocity of the object when t = 5 seconds (2 marks)

21. (a) Construct a table of values for the function  $y = x^2 - 6$  for  $-3 < x < 4$  ( 2 marks)

(b) By drawing a suitable line on the same grid estimate the roots of the equation

$$x^2 + 2x - 2 = 0 \quad ( 3 \text{ marks})$$

22. The figure below represents a plot of land ABCD, where  $BC = CD = 60$  metres,  $\angle BCD = 120^\circ$ ,  $\angle ABC = 75^\circ$  and  $\angle ADC = 85^\circ$

(a) Calculate the distance from B to through D ( 5 marks)

(b) The plot is to be fenced using poles that are 3 metres apart except at corner A, where the two poles next to the corner pole are each less than 3 metres from A. Calculate the distance from the pole at corner A to each of the poles next to it.

23. On the grid provided on the opposite page ABCE is a trapezium

(a) ABCD is mapped onto A'B'C'D' by a positive quarter turn. Draw the image A'B'C'D' on the grid. ( 1 mark)

(b) A transformation maps  $\begin{pmatrix} -2 & -1 \\ 1 & -1 \end{pmatrix}$  A'B'C'D' onto A'' B'' C'' D''

(i) Obtain the coordinates of A'' B'' C'' D'' on the grid ( 2 marks)

(ii) Plot the image A'' B'' C'' D'' on the grid (1mark)

(c) Determine a single matrix that maps A'' B'' C'' D'' ( 4 marks)