NAME ……..…… **ADM NO**……..… **DATE** ……..……

SIGNATURE ……...…….

MATHEMATICS

FORM 2

MARCH/APRIL 2024

TIME: 2 ½ HOURS

END OF TERM ONE EXAMINATION

Kenya Certificate of Secondary Education 2024

INSTRUCTIONS TO CANDIDATES

1. *Write your name and admission number in the spaces provided at the top of this page.*
2. *This paper consists of two sections:* **Section I and Section II.**
3. *Answer **al**l questions in* **section I** and Section **II.**
4. *Show all the steps in your calculations, giving your answers at each stage in the spaces below each question.*
5. *Marks may be given for correct working even if the answer is wrong.*
6. ***KNEC** Mathematical tables may be used.*

For Examiner's Use Only

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total

17	18	19	20	21

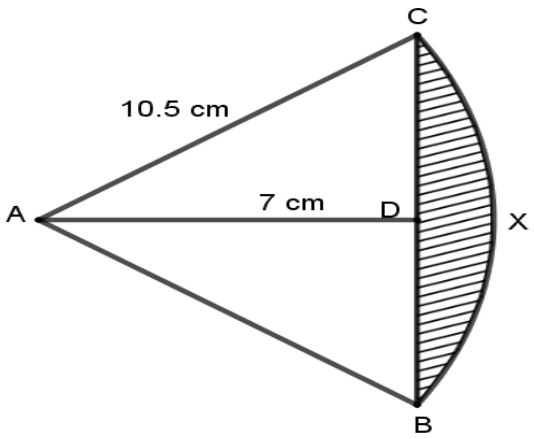
Grand Total

SECTION I (50 marks)

Answer all the questions in the spaces provided

1. There is 20% loss when an article is sold at Sh 500. At what price should it be sold to make a profit of 10% (3 marks)

2. The figure below shows a sector of a circle centre A with a segment CXBD and triangle ABC.



Given that angle CAB is $60°$, AC = AB = 10.5 cm, AD = 7 cm and BC = 15.6 cm, determine the area of the shaded region. (3 marks)

3. Find the co-ordinates of the points of intersection of the lines $3x - 4y = 1$ and $y + 7x = 23$ (3 marks)

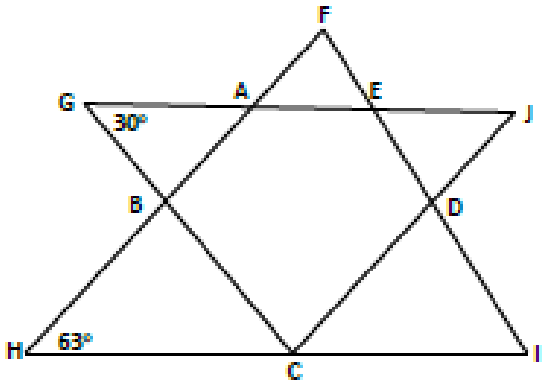
4. A farmer has 3 containers of capacity of 48 litres, 36 litres and 27 litres. Find the capacity of the smallest container that can be filled by each one of them an exact number of times.
(3 marks)

5. Use tables of reciprocals only to evaluate; (3 marks)
$$\frac{5}{0.0396}+\frac{12}{0.593}$$

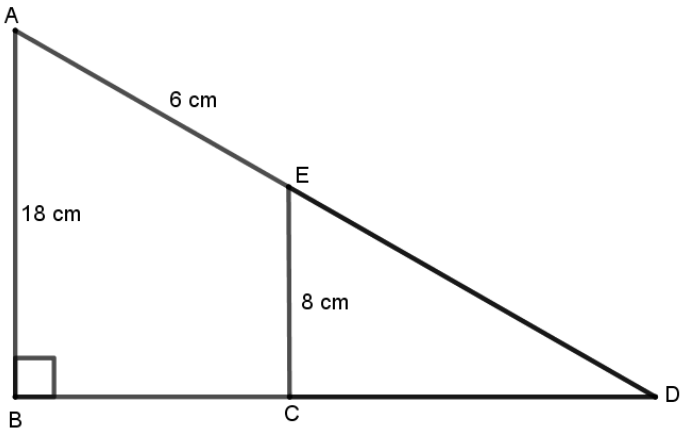
6. Find the value of x in the following equation. (3 marks)
$9^x + 3^{2x} - = 53$

7. Mwangi spent half of his July on school fees, one eighth on farming and two third of the remainder on food. Calculate his July salary, if he spent Ksh 4000 on food. (3 marks)

8. In the figure below, GJ is parallel to HI and FH is parallel to CJ. Angle $AGB = 30°$ and angle $AHC = 63°$. Find the size of angle GCJ. (3 marks)



9. In the triangle ABD, BA is parallel to CE. Given that $BA = 18\ cm$, $CE = 8cm$ and $AE = 6cm$. Find the length of DE (3 marks)



10. Use cube and reciprocal tables to solve; (3 marks)

$$0.1573^3 + \frac{1}{67.28^3}$$

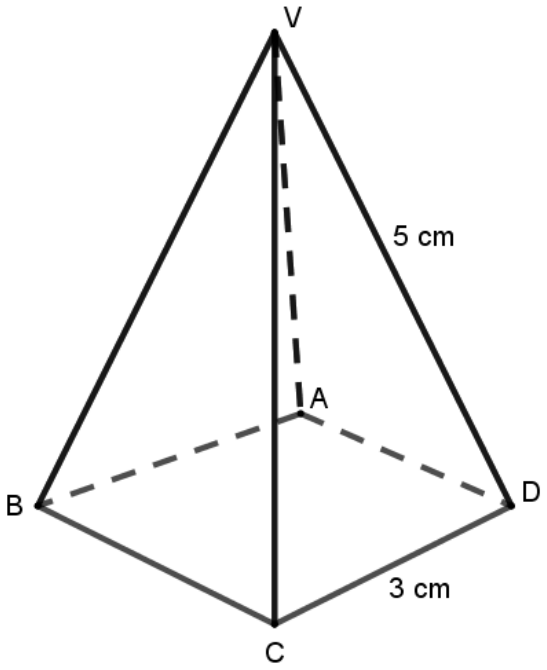
11. The volumes of two similar solid cylinders are $4752\ cm^3$ and $1408\ cm^3$. If the area of the curved surface of the smaller cylinder is $352\ cm^2$, find the area of the curved surface of the larger cylinder. (4 marks)

12. Express 5184 and 2744 in terms of its prime factors, hence determine the value of;(2 marks)

$$\frac{\sqrt{5184}}{\sqrt[3]{2744}}$$

13. Solve the exact value of $0.\dot{6} - 0.00\dot{2}\dot{4}$ (3 marks)

14. The figure below shows a square based right pyramid. The length of the base is 3 cm, and VA = VB = VC = VD = 5 cm.



a) Draw the net of the solid. (2 marks)

b) Determine the area of the net given that the area of each triangular face is 7.15 cm^2. (2 marks)

15. A certain volume of solution has a mass of 2.2 kg with density of 0.8g/cm^3. Calculate the volume of the solution in litres **(**3 marks)

16. Evaluate the following using logarithms; (3 marks)

$$\sqrt{\frac{0.64 \times (1.64)^2}{0.04 \times 384.2}}$$

SECTION II (50 marks)

Answer all the questions in the spaces provided

17. Two ships P and Q leave a port at the same time. Ship P sails at 90 km/h on a bearing of $030°$ while ship Q sails at 96 km/h on a bearing of $N60°W$.

a) Using a scale of 1cm : 20 km, draw a diagram to show the relative position of the ships after 2 hours. (4 marks)

b) Use your diagram in (a) above to determine;

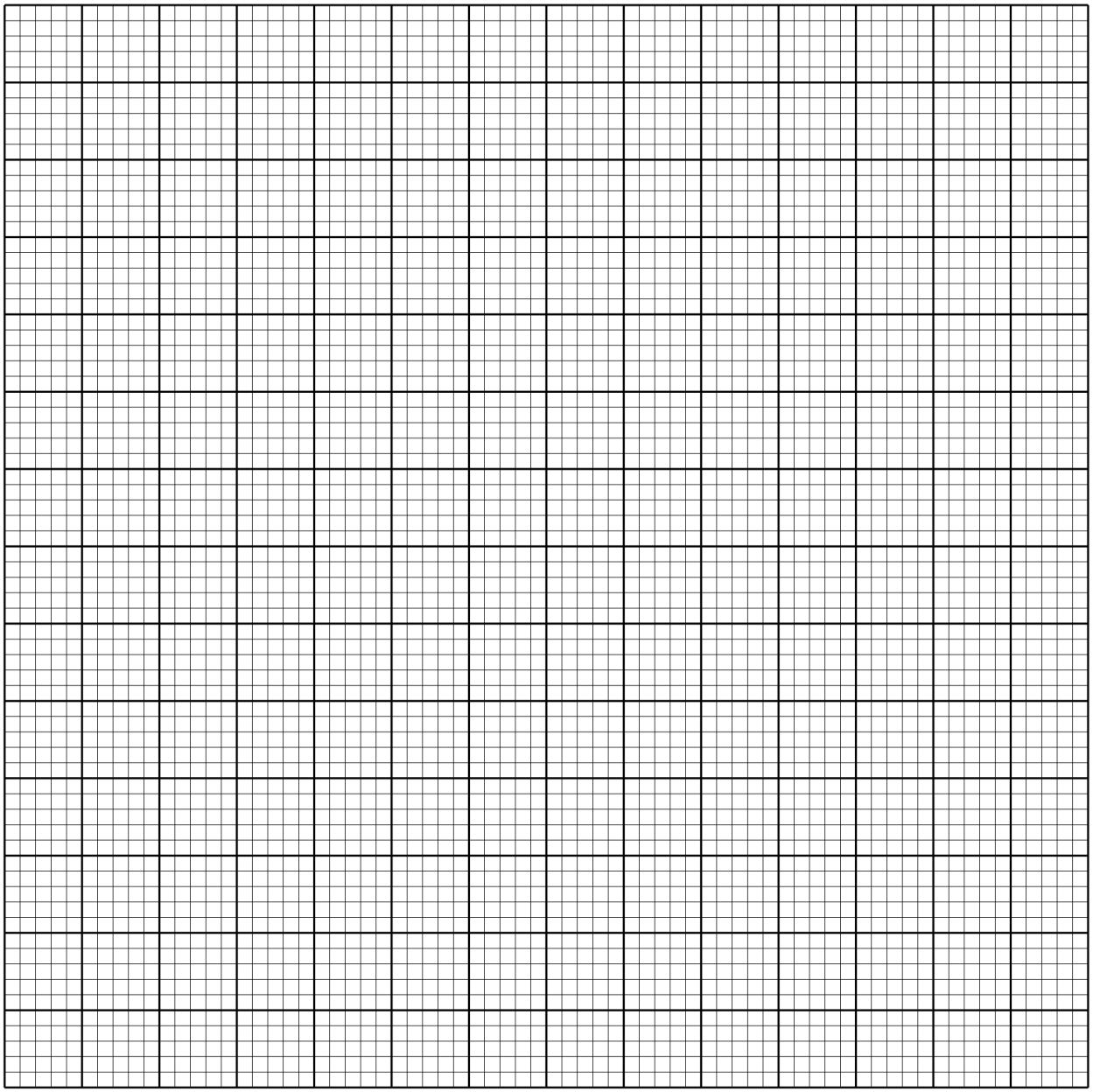
i. Distance and bearing of P from Q. (3 marks)

ii. The compass bearing of the sea port from the position of ship P after 2 hours.(1 mark)

c) How far is the sea port south of port P. (2 marks)

18. On the graph paper provided,

a) plot the triangle whose co-ordinates are $A(1, 2)$ $B(5,\ 4)$ and $C(2,\ 6)$ (3 marks)



b) On the same axes,

i. Draw the image $A'B'C'$ of ABC under a rotation of 90° clockwise about origin. (2 marks)

ii. Draw the image $A''B''C''$ of $A'B'C'$ under a reflection in the line $y = -x$. State the co ordinates of $A''B''C''$. (3 marks)

c) $A'''B'''C'''$ is the image of $A'B''C''$ under the reflection in the line $x = 0$. Draw the image $A'''B'''C'''$ and state its coordinates. (2 marks)

19. Use a ruler and pair of compass only to construct a triangle ABC in which $AB = 4.6, BC = 5.4\ cm\ and\ < ABC = 75^0$ (3 marks)

i. Measure AC (2 marks)

ii. Drop a perpendicular from B to meet AC .measure BN. (2 marks)

iii. Calculate the area of triangle ABC (3 Marks)

20. A rectangular cabin measuring 6.5m long, 4.8m wide, and 3 m high is constructed using wooden planks. The cabin has two doors each measuring 2.0 m by 1.02 m and four windows each measuring 90cm by 60cm. Each plank measures 1.8m by 15cm and costs Sh 45.50. Apart from the doors and windows all the walls and the ceiling are covered with the wooden planks.

Calculate:

(a) The total area covered with the planks. (6 marks)

(b) The number of planks used. (2 marks)

(c) The cost of planks used to construct the cabin. (2 marks)

21. A line L_1 passes through the points $(-2, 3)$ and $(-1, 6)$
Find;

a) (i) Gradient of L1. (1 mark)

(ii) Equation of line L1 (2 marks)

b) Another line L_2 is perpendicular to line L_1 and pass through point $(-1,6)$.
(i) Find the gradient of L_2 (1 mark)

(ii) Find the equation of L_2 (2 marks)

c) Given that another line L_3 that passes through point $(1,2)$ is parallel to line L_1.
(i) Find the gradient of L_3 (1 mark)

(ii) Find the equation of L_3 (2 marks)

(iii) Find the y and x intercept of line L_3 (1 mark)