

NAME..... ADM. NO..... CLASS.....

DATE:...../...../ 2022

FRIENDS GIANCHERE SECONDARY SCHOOL

END OF TERM 3 EXAM
FORM 2 - MATHEMATICS
TIME: 2½ HRS.

INSTRUCTION TO STUDENTS:

1. Write your **name, admission number** and **class** in the spaces provided above.
2. Write the **date** of examination in spaces provided.
3. This paper consists of **two** Sections; Section **I** and Section **II**.
4. Answer **ALL** the questions in Section **I** and only **five** questions from Section **II**.
5. All answers and working must be written on the question paper in the spaces provided below each question.
6. Show all the steps in your calculation, giving your answer at each stage in the spaces provided **below** each question.
7. Marks may be given for correct working even if the answer is wrong.
8. KNEC Mathematical tables **may be** used, except where stated otherwise.
9. Candidates should check the question paper to ascertain that all the pages are printed as indicated and that no questions are missing.
10. **Candidates should answer the questions in English.**

FOR EXAMINER'S USE ONLY:

SECTION I

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

SECTION II

17	18	19	20	21	22	23	24	TOTAL

GRAND TOTAL

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Ensure that all the pages are printed and no question(s) are missing

SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION

1 Use tables of reciprocals only to work out $\frac{3}{0.6735} + \frac{13}{0.156}$ 3 Marks

2 When a number u is divided by either 36, 24 or 45, the remainder is always 5. Find the least value of u . 3 Marks

3 Use logarithms tables to evaluate; $\frac{\sqrt[3]{743.1 \times 34.8}}{\sqrt{15.6 \times 102.7}}$ 4 Marks

- 4 Use mathematical tables to find the square root of 0.001952 2 Marks
- 5 Three years ago, Juma was three times as old as Ali. In two years time, the sum of their ages will be 62. Determine their present ages. 3 Marks
- 6 A triangle measures 16cm by 20cm by 24cm. Calculate its area using the Hero's formula. 3 Marks
- 7 200 cm³ of acid is mixed with 300 cm³ of alcohol. If the densities of acid and alcohol are 1.08g/cm³ and 0.8 g/cm³ respectively, calculate the density of the mixture. 3 Marks

- 8 Express as a single fraction in the simplest form; $\frac{x-3}{5} + \frac{2x-5}{4}$ 3 Marks
- 9 Three businessmen Makokha, Njau and Odhiambo contributed a total amount of sh 120,000 to start a business. The ratio of the contributions of Makokha and Njau was 2:3 and that of Njau to Odhiambo was 2:5. How much did Odhiambo contribute? 3 Marks
- 10 A regular hexagonal solid has side 5cm and a thickness of 1.9cm. Calculate its surface area. 3 Marks
- 11 A rectangular container measuring 1.2m long, 70 cm wide and 55 cm high is half full of water. All this water is poured into an empty cylindrical tank of diameter 1.4 metres. Find the height to which the water rises. 4 Marks
- 12 Solve for x in the equation $32^{X-3} \div 8^{X-4} = 64 \div 2^X$ 3 Marks

13 By the use of cubic tables find:

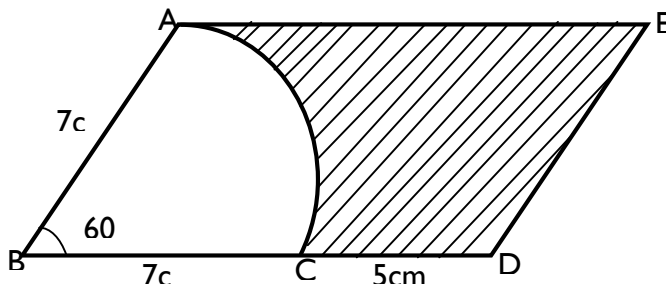
i. 0.112^3

1 Mark

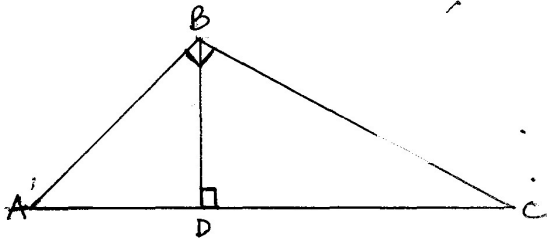
ii. $\sqrt[3]{0.0413}$

2 Marks

14 In the figure below, AC is an arc of a circle centre B, angle $ABD = 60^\circ$, $AB = BC = 7\text{cm}$ and $CD = 5\text{cm}$. If AE is parallel to BD and AB is parallel to ED. Calculate the area of the shaded region.
3 marks



- 15 In the triangle below, $AB=12\text{cm}$ $AC=13\text{cm}$ and $\angle ABC=\angle BDC=90^\circ$



Calculate;

- i. The length of BC

2 Marks

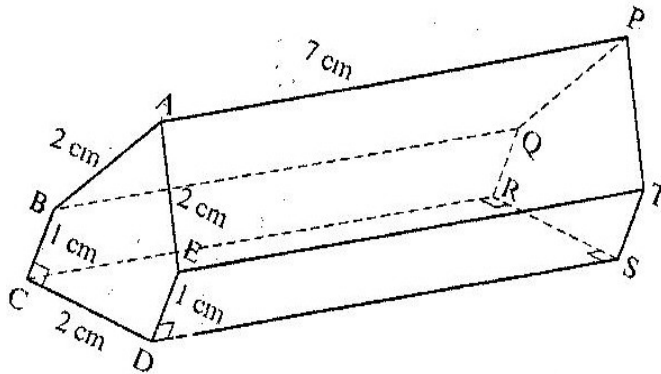
- ii. The length of BD

2 Marks

- 16 The figure below represents a prism of length 7 cm, $AB = AE = CD = 2\text{ cm}$ and $BC = ED = TS = QR = 1\text{ cm}$

3 Marks

Draw a well labelled net of the prism:



SECTION B: ANSWER ONLY FIVE QUESTIONS IN THIS SECTION

17 1. A line L_1 passes through $(3, -2)$ and $(5,4)$.

a. Determine the gradient of line L_1

[1 Mark]

b. The equation of line L_1

[2 Marks]

c. Line L_1 cuts $x - axis$ at point P and the $y - axis$ at point Q. determine the co-ordinates of P and Q.

[4 Marks]

d. Another line L_2 passes through $(-3,7)$ and is perpendicular to L_1 . Determine its equation.

[3 Marks]

- 18 A Japanese tourist came to Kenya through England. In Japan, he changed 4,716,390 Japanese Yens into U.S \$. While in England, he changed all his money to Sterling pound £ and spent 30% of his sterling pounds there. Before leaving for Kenya he converted the sterling pounds into Shillings. He spent 80% and gave 20% balance to a charitable organisation.

Exchange Rates

1 U.S Dollar (\$) = 103.6 Yen(¥)

1 Sterling Pound £ = 1.5 U.S dollar(\$)

1 Sterling Pound £ = 83.5 Kshs.

- a. How much money in U.S dollars did he declare on arrival in England? (3 Marks)
- b. How much money in Sterling Pounds did he spend? (3 Marks)
- c. How much money did he spend in Kenya in Kshs before giving to the charitable organisation? (2 Marks)
- d. How much money was given to the charitable organisation in Kshs. (2 Marks)

- 19 Mr. Koech requested a surveyor to survey his piece of land. The table below gives a field book showing the results of the survey between X and H. All measurement are in metres. $XH=300m$

	H	
C60	260	
B80	190	D50
A60	150	
	80	E65
	50	F40
	X	

- a) Draw an accurate diagram of the piece of land. (take 1 cm to represent 20m) (3mks)

- b) Mr. Koech divides the piece of land to his son and daughter. The son is given the part XABCH while the daughter takes the opposite side.
- i. The son decides to fence his piece including the common border XH, on an average posts are placed 2.5m. Find the total number of posts required. (3mks)

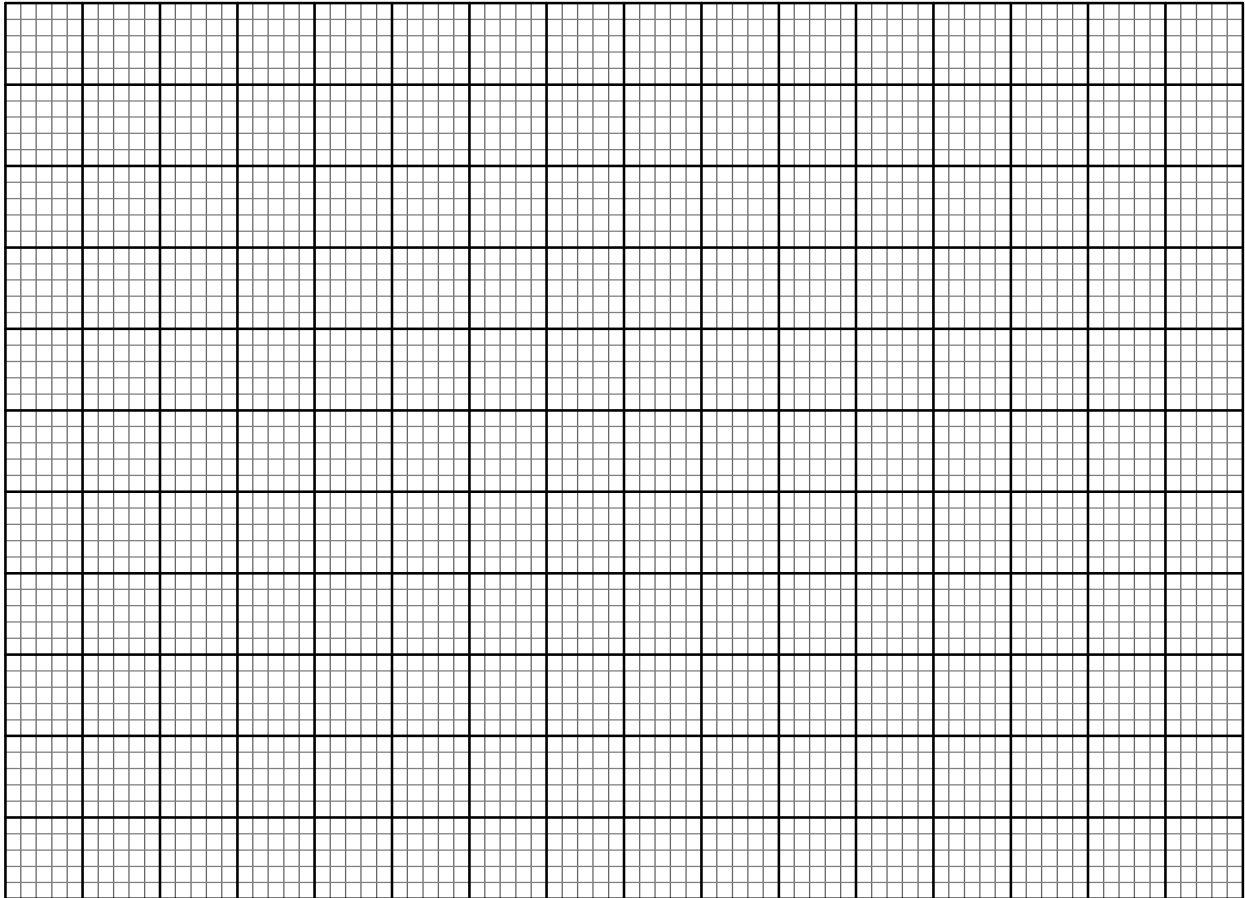
ii. A roll of wire is 100m long and he wishes to use 4 strands when fencing. Determine the number of rolls of wire required. (2mks)

iii. What is the cost of fencing the field if one roll of wire costs sh.4500? (2mks)

20 A triangle PQR has co-ordinates P(1,1) Q (1,3) R (3,1)

a. Plot the triangle in the graph paper provided.

[1 Mark]



b. P'Q'R' is the image of PQR under an enlargement scale factor 2 about origin.

i. Plot P'Q'R' in the graph provided.

[3 Marks]

ii. State the co-ordinates of P'Q'R'.

[1 Mark]

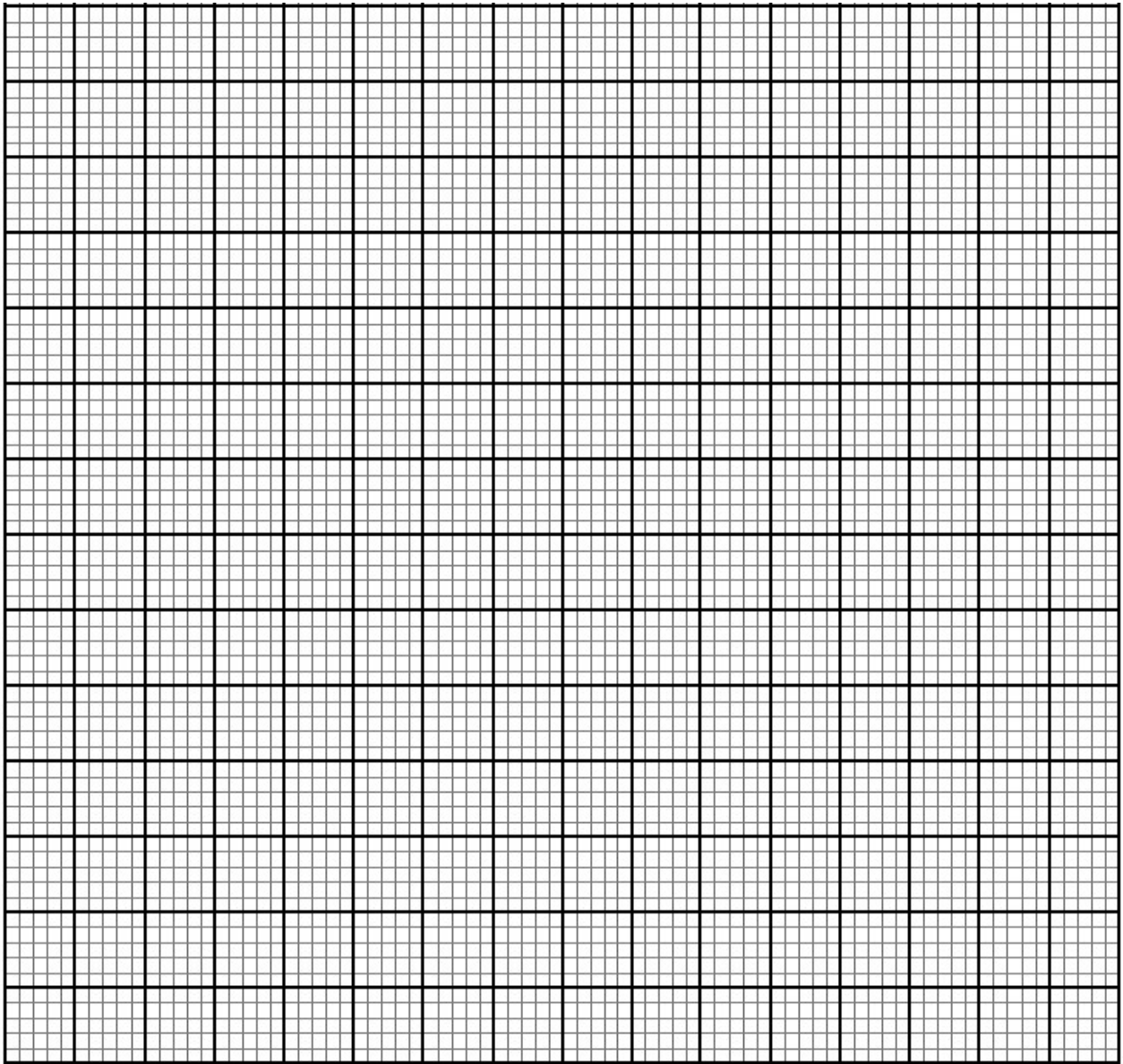
c. P''Q''R'' is the image of P'Q'R' under reflection in the $y - axis$. Plot P''Q''R'' in the graph paper and state its co-ordinates.

[4 Marks]

d. Calculate the area of triangle P''Q''R''

[1 Mark]

- 21 a. On a Cartesian plane plot and draw the triangle ABC, A(1,2), B (1,6), C (5,5) [2 Marks]



b.

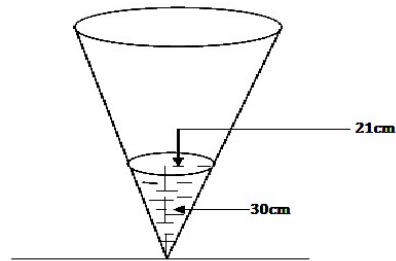
Draw the image of triangle ABC after reflection on the line $y = x$ 2mks

c. Draw $\triangle A''B''C''$ the image of $\triangle ABC$ after reflection along y – axis [2 Marks]

d. Draw $\triangle A'''B'''C'''$ the image of $\triangle A''B''C''$ after rotation through -180° about the origin [2 Marks]

e. Determine the mirror line that makes $\triangle A''''B''''C''''$ the image of triangle ABC [2 Marks]

- 22 The diagram below represents a conical vessel which stands vertically which stands vertically. The vessels contains water to a depth of 30cm. The radius of the surface in the vessel is 21cm. (Take $\pi=22/7$).



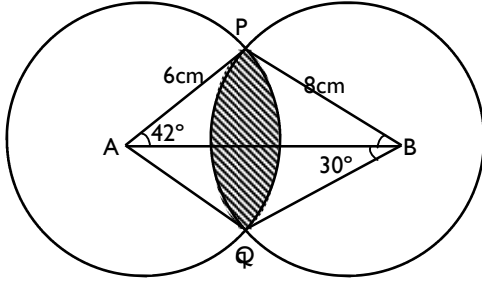
- a) Calculate the volume of the water in the vessels in cm^3 (2 Marks)

- b) When a metal sphere is completely submerged in the water, the level of the water in the vessels rises by 6cm.

Calculate:

- (i) The radius of the new water surface in the vessel; (2 marks)
- (ii) The volume of the metal sphere in cm^3 (3 marks)
- (iii) The radius of the sphere. (3 marks)

- 23 The figure below shows two circles centres A and B and radii 6 cm and 8 cm respectively. The circles intersect at P and Q. Angle PAB = 42° and angle ABQ = 30° .



(a) Find the size of $\angle PAQ$ and $\angle PBQ$. (1mks)

(b) Calculate, to one decimal place the area of:

(i) Sector APQ and PBQ. (4mks)

(ii) Triangle APQ and PBQ. (4mks)

(iii) The shaded area (take $\pi = \frac{22}{7}$) (1mks)

24 A school hall measure 10m long, 7m wide and 4m high. All its inside walls and ceiling are painted.

Calculate,

i. The total surface area painted 4 mks

ii. The cost of painting at 200/= per square metre. 2 Mks

iii. Calculate the volume of the hall. (2 mks)

iv. If the density of the air is 0.8 g/cm^3 . What is the mass of air in the hall? (2 mks)