KCSE TRIAL 2020
MATHEMATICS PAPER 1

SECTION I [50 marks]
Attempt All the Questions

1. Evaluate $\dfrac{\frac{1}{2} \text{ of } 3\frac{1}{2} + 1\frac{1}{2}\,(2^{1}/_{2} - {}^{2}/_{3})}{\frac{3}{4} \text{ of } 2\frac{1}{2} \div \frac{1}{2}}$ (3 marks)

2. Mr.Rotich decided to honour his top 3 students in Mathematics by sharing sh 12,000 in the ratio 6:5:x for the first, second and third student respectively. If student number 2 got sh 4,000, find the value of x.   .   (3 marks)

3. Express $3.02\ddot{2}\ddot{3}$ as a fraction.   (2 marks)

4. O is the center of the circle below and AB is parallel to DC. Angle ACD=70° and angle ACB=10° (3 marks)
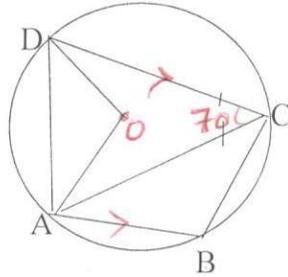
Calculate the angles:
(i) ABC   (2 marks)

(ii) OAD   (2marks)

5. A sphere has a radius of 3.0cm. Find its density if the sphere has a mass of 100grams.
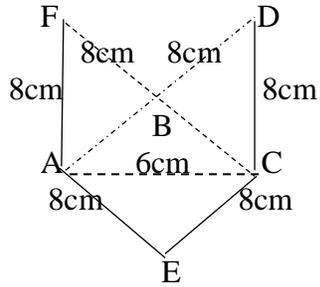   (3 marks)

6. Use reciprocal table to evaluate reciprocal of 0.3654. Hence find $\dfrac{\sqrt{3.24}}{0.3654}$ to 3 significant
    figures   (3 marks)

7. Below is a net of a model of a 3- dimensional figure. The lengths AB=BC=AC=6cm and
    lengths AF = FB = BD = CD = CE = AE = 8.0 cm.   (3 marks)

(a) Sketch the solid model taking ABC as the base and height 5cm. (2 marks)

(b) Name the figure sketched. (1 mark)

8. Using logarithm tables, evaluate. (4 marks)

$$\frac{\sqrt[3]{47.26 x 0.866^2}}{345.8}$$

9. A line has the equation 3x – 2y – 5 = 0. Find:
(a) The gradient of the line. (1mark)

(b) The equation of the line in the form y = mx+c that passes through the point (4,6) and is perpendicular to the given line. (3 marks)

10. The exterior angle of a regular polygon is $(x-50)^o$ and the interior angle is $(2x+20)^o$. Find the number of sides of the polygon. (3 marks)

11. Simplify $\dfrac{x-5}{x+5} - \dfrac{7x-35}{x-25}$ (3 marks)

12. The cost of a camera outside Kenya is US $1,000 Jane intends to buy one camera through an agent who deals in Japanese. The agent charges her a commission of 5% on the price of the camera and further 1260 Yen as importation tax. How much Ksh will she need to send to the agent to obtain the camera, given that (4 marks)

1 U $ = 105.00 Yen
1 US$ = Ksh 63.00

13. Given that $\mathbf{a}\begin{pmatrix}2\\3\end{pmatrix}$ and $\mathbf{c} = \begin{pmatrix}3\\5\end{pmatrix}$ and $\mathbf{a} + 2\mathbf{b} = \mathbf{c}$. Find:

(i) $\mathbf{b}$ (2 marks)

(ii) Magnitude of $(\mathbf{a} + \mathbf{b})$ correct to 2 decimal places   (2 marks)

14. A circle of radius 10.5cm has a sector whose angle at the centre of 12° is cut off. Find the perimeter of the resulting sector.   (2 marks)

15. Find all integral values of x which satisfy the inequalities $x + 11 > 4x - 19 \geq (2 - x)$

(3 marks)

16. A number q is such that when it is divided by 27, 30 and 45 the remainder is always 3. Find the smallest value of q. (2 marks)

SECTION II – 50
Attempt Only Five Questions

17. A passenger train travelling at 25Km/hr is moving in the same direction as the truck travelling at 30km/hr. The railway line runs parallel to the road and the truck takes 1 ½ minutes to overtake the train completely.
(a) Given that the truck is 5m long determine the length of the train in metres. (6 marks)

(b) The truck and the train continue moving parallel to each other at their original speeds. Calculate the distance between them after 4 minutes and 48 seconds after the truck overtake the train. (2 marks)

(c) The truck stopped 45 minutes after overtaking the train. How long did the train take to catch up with the truck? (2 marks)

18. The table below shows the distribution of marks scored by 40 students in an examination.

Class interval	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-99
Frequency	2	3	6	11	8	x	2	1

(a) Find the value of x (1 mark)

(b) State the modal class (1 mark)

(c) Calculate the mean mark correct to 2 d.p (4 marks)

(d) Calculate the median mark (4 marks)

19. A school water tank is in the shape of a frustum of a cone, the height of the tank is 7.2m and the top and bottom radii are 6m and 12m respectively.
(a) Calculate the slant height of the frustum, correct to one decimal place.   (2 marks)

(b) Calculate the area of the curved surface of the tank correct to 2 d.p.   (3 marks)

(c) Find the capacity of the tank, in litres correct to the nearest litre.   (3 marks)

(d) On a certain day, the tank was filled with water. If the school has 500 students and each student uses an average of 40 litres of water per day, determine the number of days the student s would use the water. (2 marks)

20. In Bomet country, a tailor bought a number of suits at a cost of sh 57,600 from wholesaler. Had he bought the same number of suits from a supermarket, it would have cost him sh 480 less per unit. This would have enabled him to buy four extra suits for the same amount of money.
(a) Find the number of suits the tailor bought. (7 marks)

(b) The tailor later sold each suit for sh 720 more than he paid for it. Determine the percentage profit he made. (3 marks)

21. A triangle BC with vertices A A(-4,2), B(-6,6) and C(-6,2) undergoes enlargement scale factor -1 and centre (-2,6) to produce triangle $A^IB^IC^I$.

(a) On the grid provided draw triangle ABC and its image $A^IB^IC^I$, state the co-ordinates of $\Delta A^IB^IC^I$ (4 marks)
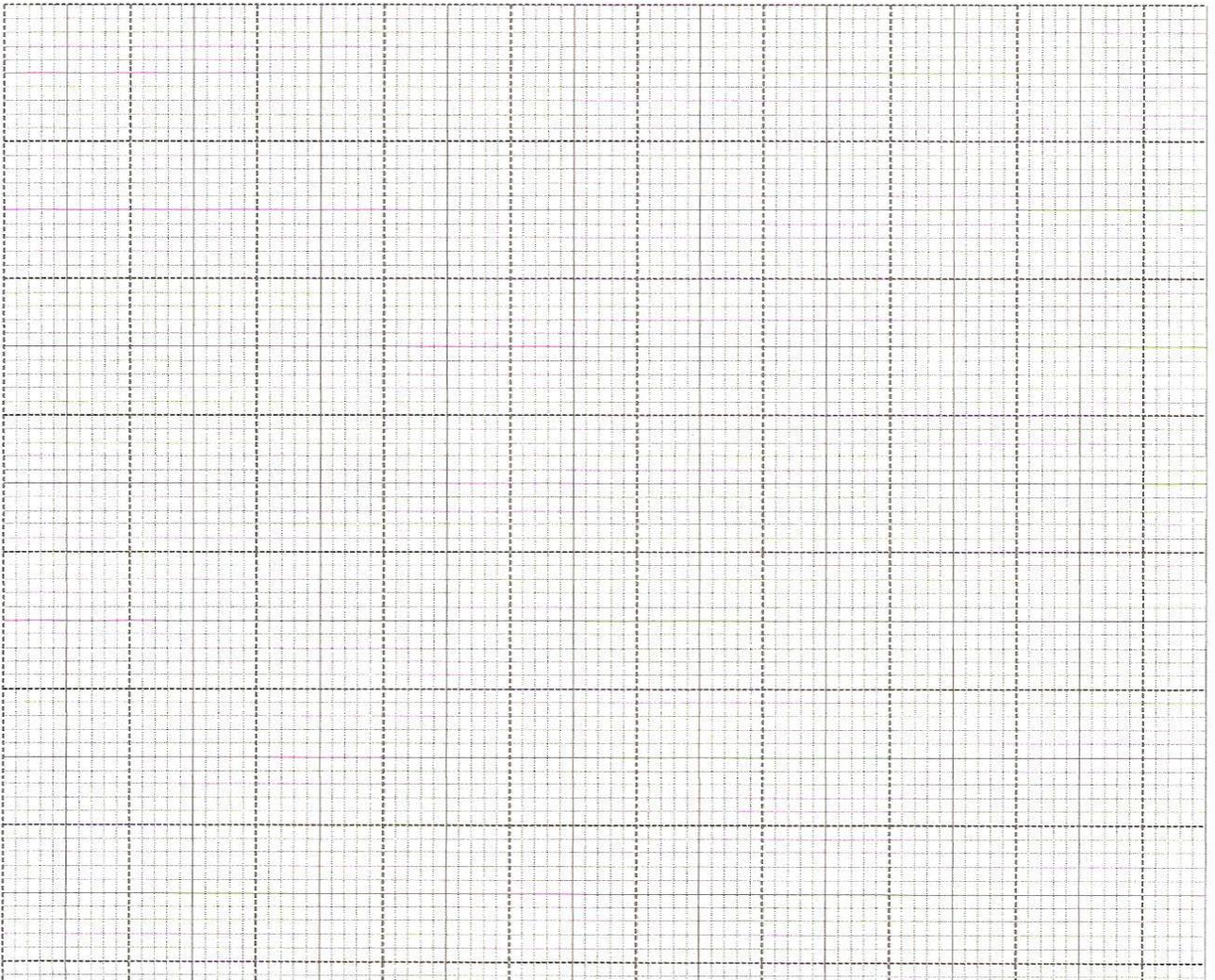
(b) Triangle $A^IB^IC^I$ is the reflected in the line y+x to give $A^{II}B^{II}C^{II}$. Draw triangle $A^{II}B^{II}C^{II}$ and state the co-ordinates of its vertices. (3 marks)

(c) If triangle $A^{II}B^{II}C^{II}$ is mapped onto a triangle whose co-ordinates are A^{III} (-4,-2), B^{III} (-6,-6) and C^{III} (-6,-2) by a rotation, find the centre and angle of rotation.   (3 marks)

22. The figure below shows a piece of land ABC not drawn to scale. Angle BDC is obtuse.
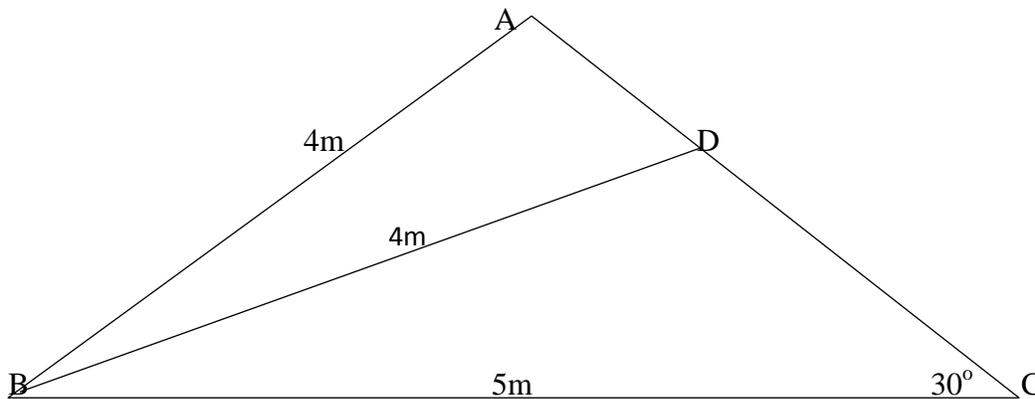
Calculate correct to 2 decimal places

(a) Angle BC   (3 marks)

(b) Length AD   (3 marks)

(c) Length DC   (2 marks)

(d) Area of triangle ABC   (2 marks)

23. The following measurements were recorded in a field book of a farm in metres
    (xy = 400m)

	Y	
	400	
C60	340	
	300	120D
	240	100E
	220	160F
B100	140	
A120	80	
	X	

(a) Using a scale of 1cm representing 40m draw an accurate map of the farm. (4 marks)

(b) If the farm is on sale at Ksh 80,000.00 per hectare, find how much it costs.   (6 marks)

24. A trader bought 5 shirts and 2 trousers at a cost of sh 2400. If he had bought 2 shirts and 4 trousers, he would have spent sh.3200.

(a) (i). Form two equations to represent the information above.   (2 marks)

   (ii). Using matrix method find the cost of a shirt and a trouser.   (4 marks)

(b) If the trader bought 16 shirts and 20 trousers and sold them making a profit of 20% per shirt and 15% per trouser, find the percentage profit made on the total sale. (4 marks)