FORM FOUR CLUSTER KCSE MODEL9

MATHEMATICS PAPER 1 QUESTIONS

SECTION A (50 Marks)

Attempt all questions

1. Without using a calculator, evaluate in its simplest form $\frac{4\ of\ 20+10\div-5-3\times6}{6\times9-4\div2+12\ of\ 6}$

2. a) Find the G.C.D of 36 and 54

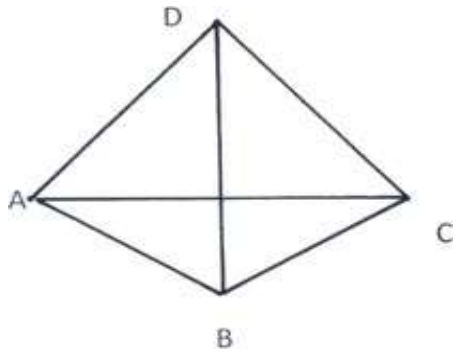
   b) If three numbers 36,54 and x have a GCD of 6 and L.C.M is 216, find the least value of x

3. Make x the subject of the formula
$$\frac{a}{b}=\sqrt[3]{\frac{dx+z}{cx-e}}$$

4. The interior angle of a rectangle polygon is three times its exterior. Determine the number of sides of the polygon and name the polygon.

5. Given that 17 y 48 is divisible by both 3 and 4, find the possible values of the digits y and state the numbers.

6. The figure below is a triangular based pyramid ABCD.



   Draw a proportional sketch of the net of the solid and label the vertices.

7. The n^{th} term of a sequence is $3n+2$

   a) State first four terms of the sequence.

   b) Determine the sum of the first 50 terms of the series.

8. Given that $\underset{\sim}{a}=2\underset{\sim}{i}+4\underset{\sim}{j}$ and $\underset{\sim}{b}=2\underset{\sim}{i}-\underset{\sim}{j}$,

Find $|2\underset{\sim}{a} - 3\underset{\sim}{b}|$

9. A cloths vendor sold 4 shirts and 3 trousers for sh.1200 and 6 shirts and 5 trousers for sh.1920. Find the cost of 1 shirt and the cost of 1 trouser.

10. An American tourist arrived in Kenya and convert the US $ 4500, He brought into Kenya shilling at a Barclays bank whose rates are indicated below:

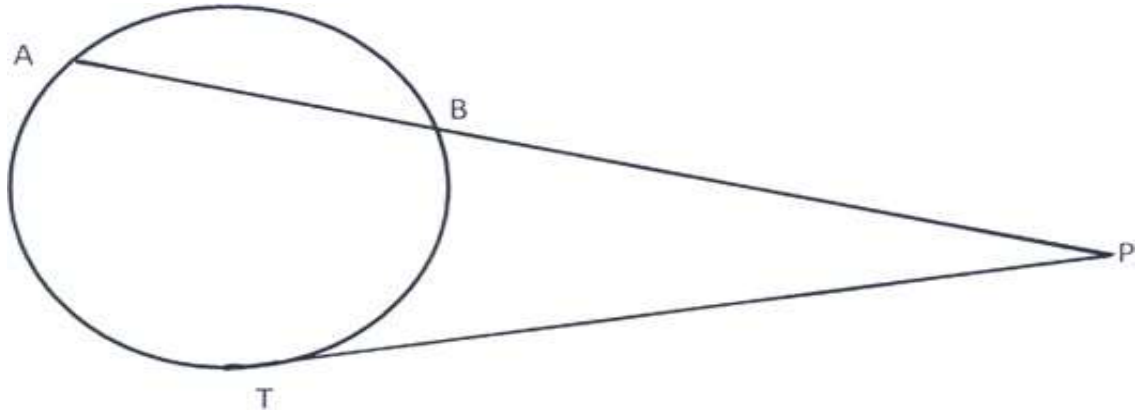
Currency	Buy	Sell
1 US $	81.70	82.50
1 UK £	127.50	128.40

During his stay in Kenya, he spent Ksh.82,480 and Ksh.92,600 on accommodation and travel respectively. He went to the same bank and converted the rest into sterling pounds, calculate how much he got.

11. Solve for x in the equation $343^{-x} \div 7^{(x-2)} = 49^{(x-2)}$

12. A line AB is parallel to the line given by the equation 2y=3x+4, coordinate of point A is (2,1). Find the equation of the line AB in the form ax+by+c=0

13. In the figure below, TP is a tangent



Given that TP = 7cm, and that AP is 5cm longer than BP, find the length of BP.

14. A flower garden was surveyed by taking one base line PQ and measuring only three offsets. The measurements were recorded in surveyor's field book as shown below.(measurements are in metres)

	Q 60 40.....	15C
B 20.....	30	
	20.....	10A
	P	

a) Draw a sketch of the garden

b) Calculate the area of the flower garden in hectares.

15. Use reciprocal, square roots and cube tables to find the value of y to 4s.f given that:

$$\frac{1}{y} = \sqrt{0.002346} + 0.173^3$$

16. Given that

$$\frac{x(x^2-1)}{x+1}, \text{ find } \frac{dy}{dx}$$

SECTION B (50 Marks)

Answer only five questions

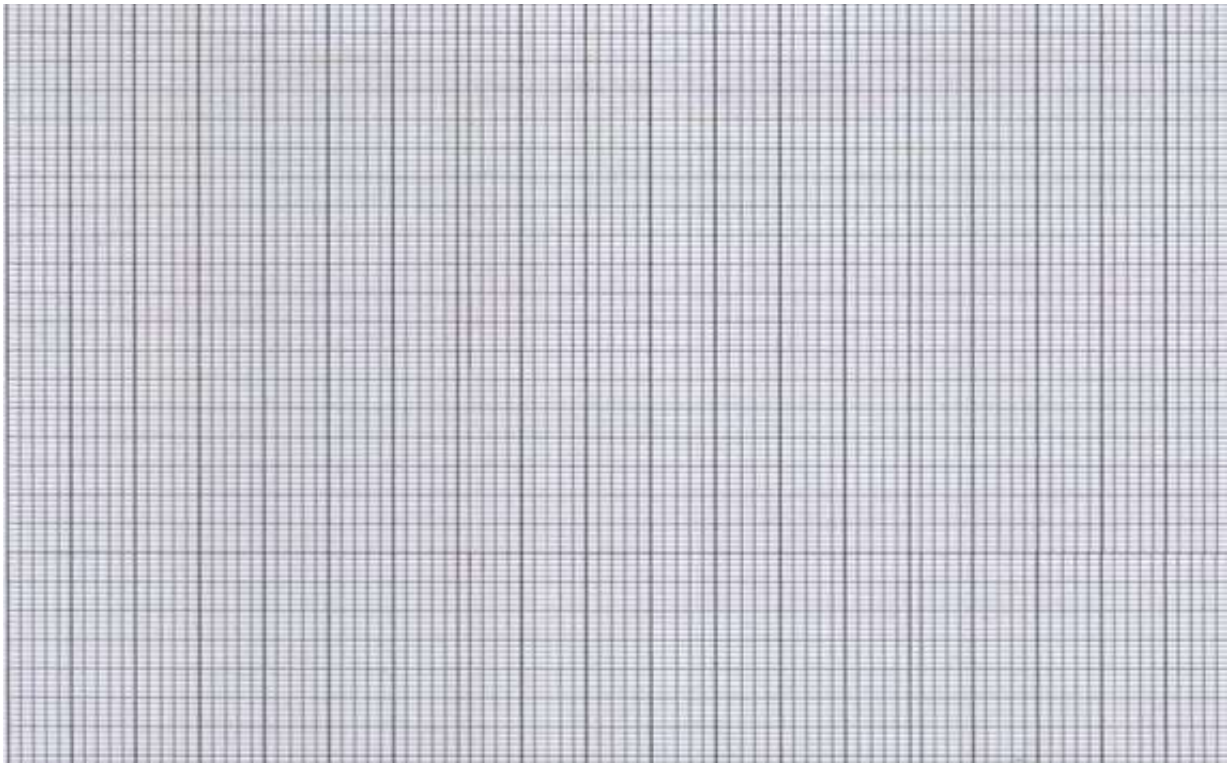
17. a) John bought a piece of land at 256,000. Six years later the value of land had appreciated by 35% of the original value. He then decided to sell it. If the buyer paid deposit of 25%, calculate the amount that remained

b) Tuwei bought a lorry in USA for sterling pounds 10,000. He paid transportation charges from USA to Kenya amounting to 500 Us dollars. On arrival to Kenya he paid import duty of 20% of the buying price and clearance tax of 0.5% of its total value in Kenya. If exchange rate were as follows: 1 Sterling pound = 1.50 US dollars 1 Sterling pound =120.00 Kenya shillings 1Us dollars = 80.00 Kenya shillings

i) Calculate the total amount paid for the lorry by Tuwei.

ii) If Tuwei later on sold the lorry at a profit of 10%, find how much profit was he paid.

18. On the grid provided below ABCD is a kite with vertices A(1, 1), B(6, 2), C(6, 6) and D(2,6) On the same axis



a) Draw A1B1C1D1 the image of ABCD under a positive quarter turn about the origin.

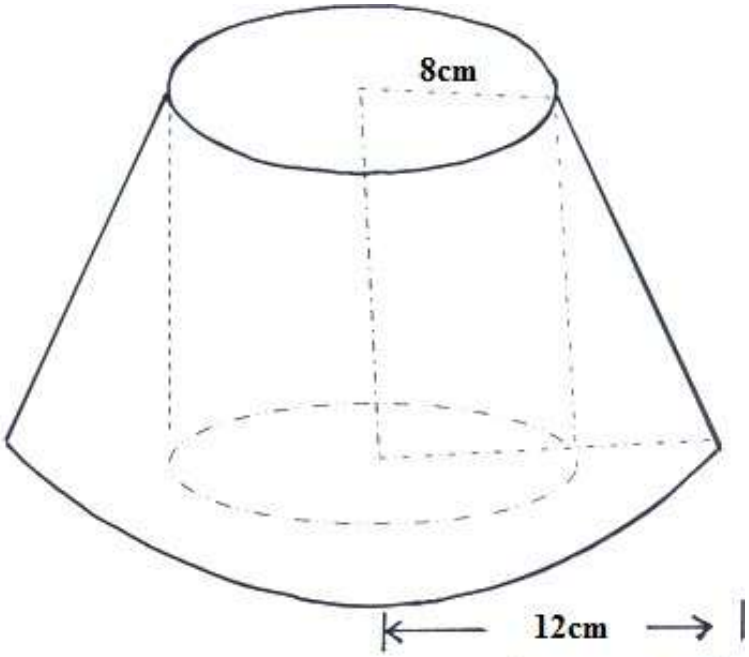
b) Draw $A^{11}B^{11}C^{11}D^{11}$ the image of $A^{1}B^{1}C^{1}D^{1}$ under the translation given by vector $\begin{pmatrix} -2 \\ 0 \end{pmatrix}$.

State the coordinates of $A^{11}B^{11}C^{11}D^{11}$

c) Draw $A^{111}B^{111}C^{111}D^{111}$ the image of $A^{11}B^{11}C^{11}D^{11}$ under reflection in line $y = 0$

d) Find the equation of the line $A^{111}C^{111}$

19. The figure below shows part of a solid circular cone whose original height was 20cm before part of its top was cut off. The radius of the base is 12cm and that of the top 8cm. A circular hole of radius 8cm was drilled through the centre of the solid as shown



Calculate the volume of the remaining solid $[Take\ \pi = 3.142]$

20. Three warships X, Y and Z at the sea are such that ship X is 500km on a bearing of 0300 from ship X, ship Z is 750km from ship y and on a bearing of 1200 from ship y. An enemy warship P is sighted 1000km due south of ship Y.

    a) Taking a scale of 1cm to represent 100km, locate the positions of ships X, Y, Z and P.

    b) Find the true bearing of i) Ship X from ship P

    ii) Ship P from ship Z

    c) Use the scale drawing to determine i) The distance from P to X

    ii) The distance of Z from P.

    d) Find the compass bearing of i) X from Z

    ii) Y from P

21. A matatu left Eldoret at 7.45am and travelled towards Nairobi at an average speed 60km/hr. A saloon car left Eldoret at 9.15am on the same day and travelled along the same road at an average speed of 120km/hr. The distance between Eldoret and Nairobi is 360km.

    a) Determine the time of the day when the saloon car overtook the bus.

    b) Both vehicles continued towards Nairobi at their original speeds. How long had saloon car waited in Nairobi before matatu arrives?

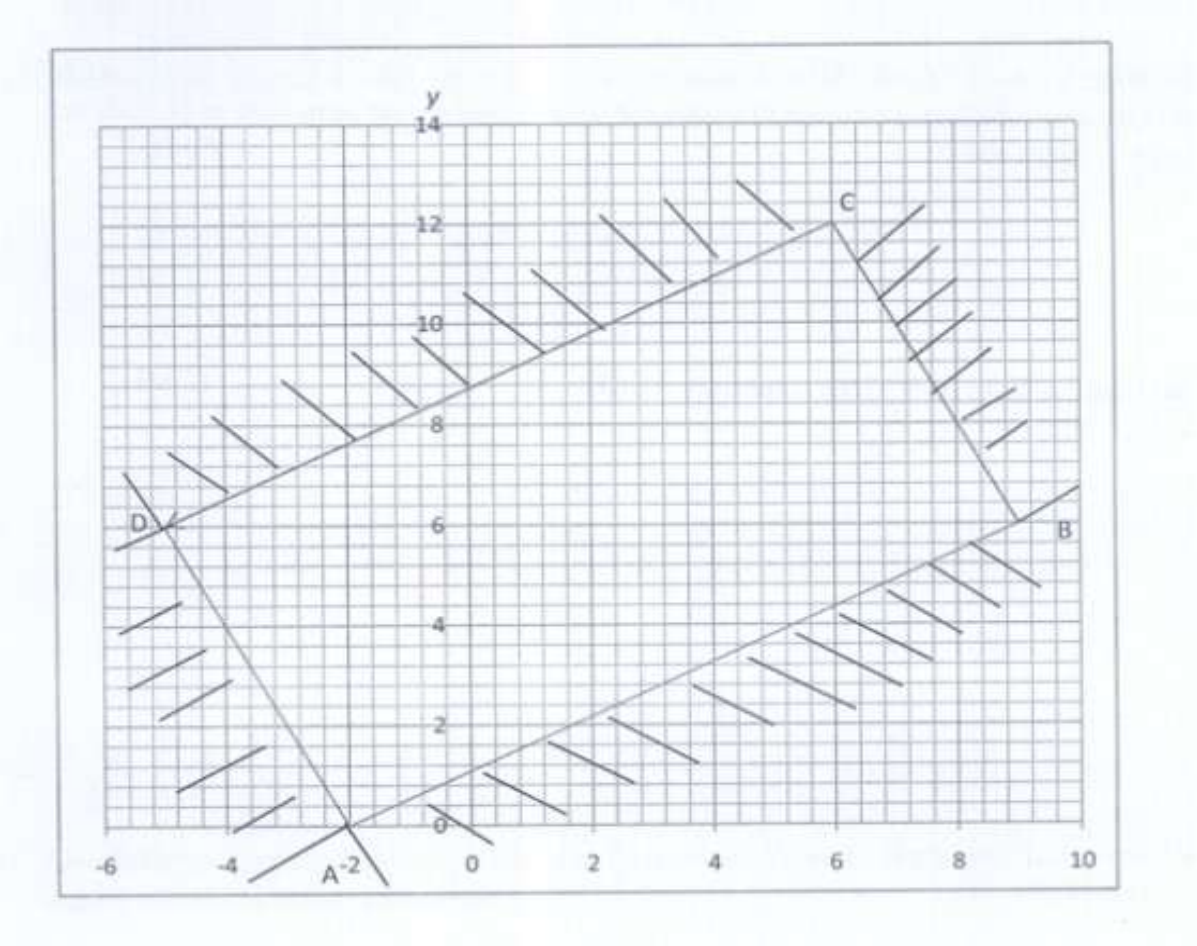
22. a) Draw a rectangle ABCD of length AB = 7.5cm and width 4.8cm and construct the locus of points, P, within the rectangle such that P is equidistant from BC and CD

    b) If the locus of P meets AB at measure AN.

c) Construct the locus of point Q within the triangle and on the same side as D, such that angle NQC = 60^0

d) Determine the area of the trapezium ANCD

23. a) Find the inequalities that satisfy the region ABCD in the diagram below where A(-2,0), B(7,6),C(6,12) and D(-5,6)



b) Calculate the area bounded by the inequalities in (a) above.

24. The displacement, S, metres of a particle moving along a straight line after t seconds is given by $s = t^3 - 4t^2 + t - 6$

a) Find its initial acceleration.

b) Find its velocity and acceleration when t = 2

c) Find the maximum speed attained

d) Find the velocity attained in the third second.