FORM FOUR CLUSTER KCSE MODEL11

MATHEMATICS PAPER 2 QUESTIONS

SECTION I (50 Marks)

Answer ALL questions in this section

1. Find the number of terms that will give a sum of 800 in the series.

   2 + 6 +10 +…………..

2. Awino can plough a piece of land in 3 days while Achieng can plough the same piece in 5 days. Find how long they would take working together.

3. The height and radius of a cone are measured as 21cm and 14.0cm respectively. Taking π 3.142. , find the percentage error in the volume of the cone.

4. The scale of a map is given as 1 : 50,000. Find the actual area in hectares of a region represented by a triangle of sides 6cm by 7cm by 5cm. (Give your answer to the nearest whole number).

5. Use logarithms to evaluate

$$\left(\frac{Cos\,57.6^0 \times 12.14}{Log\,8 \div 21.55} \right)^{\frac{-1}{4}}$$
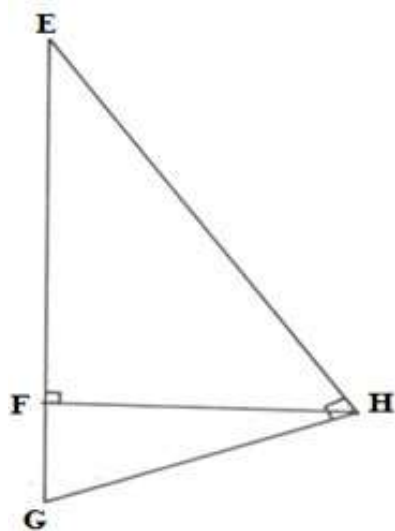
6. An arc subtends an angle of 0.9 radians at the centre of a circle whose radius is 13cm. Find the length of the arc.

7. Evaluate

$$Log_2{}^x + Log_x{}^2 = 3$$

8. Make x the subject of the formula.

$$P = \frac{Q(S - R^x)}{S - R}$$

9. A candidate scored the following marks in K.C.P.E; 46,78,55,58 and 53. Calculate her standard deviation.

10. a) Expand $(1-2x^4)$ (2marks)
    b) Use the first four terms of your expansion to find the value of 0.99^4. (2marks)

11. In the figure below; $<EHG = <EFH = 90^0$ and HF=7.5cm and EF =18cm.

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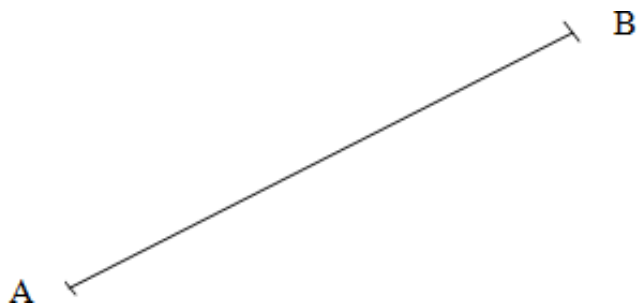
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Calculate the length
a) HG (2marks)

b) FG (2marks)

15. The figure below shows a line AB.

a) Without using a protractor, construct a line AC such that <BAC = 67.5^0 and AC =8cm. (2marks)

b) Using line AC divide line AB into 6 equal portions. (3marks)

16. Find the radius and the co-ordinates of the centre of a circle whose equation is given as

$$6y^2 - 9x + 6x^2 + 6y + \frac{3}{2} = 0$$

SECTION II (50 Marks)

Answer only FIVE questions from this section
18. Without using a protractor, construct line xy =8cm.

a) Construct the locus of all points R such that <XRY = 60^0. (4marks)

b) Construct the locus of all points P such that the area of triangle XPY is $16cm^2$. (3marks)

c) Mark all the points where the locus of R intersects the locus of P with A,B,C and D. (3marks)

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19. A cylindrical tank is such that the sum of its radius and height is 9m.

a) Calculate the maximum possible area of the curved surface. (6marks)

b) If the height is increased by 12% and radius decreased by 10%, find the percentage change in its volume. (4marks)

20. The velocity V metres per second of a vehicle is related to the time t seconds

$V = t^2 - 2t + 3$

t	1	2	3	4	5	6	7	8	9	10	11	12	13
v	2		6		18			51		83		123	

a) Complete the table above. (2marks)

b) Use the trapezium rule to determine the total distance travelled by the vehicle from t = 1 to t = 12 seconds using 6 strips. (3marks)

c) Use calculus to determine i) The exact distance travelled by the vehicle from t = 1 to t = 13 seconds. (3marks)

ii) Find the percentage error in determining the distance by trapezium rule. (2marks)

21. A student in a Maths club has six identical number cards 1 – 6 and five letter cards a, b,..............., e. The student asks one of the members to pick one number card and one letter card then records the outcome.

i) Prepare his / her probability space. (2marks)

ii) Find the probability that the letter card was a consonant. (3mks)

iii) A number card was an even number. (2mks)

iv) The letter card was a vowel and number card was a prime number. (3mks)

22. The table below shows the rate of taxation in a certain year.

Income (K £ p.a)	Rate of tax in Kshs per K£
1 - 3900	2
3901 - 7800	3
7801 - 11700	4
11701 – 15600	5
Above 15600	8

Anguila is housed by his employer and therefore 15% of the salary is added to the salary to make taxable income. He pays a nominal rent of Kshs. 2075 per month. His total tax relief is Ksh 1056 per month. If his P.A.Y.E per month is Ksh 4270, calculate.

a) Anguila's gross tax. (2marks)

b) His monthly income in Kshs. (8marks)

23. The table below shows the distribution of the wages in a week for 50 employees in a certain factory:

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Wage (Ksh)	800 - 899	900 -999	1000-1099	1100-1199	1200-1299
No. of workers	3	10	25	9	3

a) Using Ksh 1049.5 per week as the assumed mean wage, calculate:

i) The mean for the grouped wages. (3marks)

ii) The standard deviation of the wages. (4marks)

b) Estimate the median wage. (3marks)

24. A baby food manufacturer wishes to mix two brands of food so that the vitamin content per kilogram of the mixture is at least 18 units of vitamin A, 14 units of vitamin B, 20 units of vitamin C and 24 units of vitamin D. The vitamin content per kilogram of each brand is shown in the table below.

	Vitamin content			
Vitamin	A	B	C	D
Brand 1	4	2	2	2
Brand 2	2	2	4	6

If Brand 1 costs sh 10 per kilogram and Brand 2 Ksh 14 per kilogram, find the minimum cost per kilogram of such a mixture.

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