

**KITUI WEST SUB- COUNTIES KCSE REVISION MOCK
EXAMS 2015**

**MATHEMATICS
PAPER 1**

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NAME _____
SCHOOL _____

INDEX NO. _____
SIGNATURE _____
DATE _____

121/1
MATHEMATICS
PAPER 1
JULY / AUGUST, 2015.
TIME: 2½ HOURS

KITUI WEST, MATINYANI, MUMONI & TSEIKURU SUB-COUNTIES
FORM FOUR JOINT EXAMINATION, 2015
Kenya Certificate of Secondary Education (K.C.S.E)

121/1
MATHEMATICS
PAPER 1
TIME: 2½ HOURS

INSTRUCTIONS TO CANDIDATES

- Write your name, school and index number in the spaces provided above.
- Write the date of examination and sign in the spaces provided above.
- This paper consists of **TWO** sections. Section I and Section II.
- Answer **ALL** the questions in section I and only **FIVE** questions from Section II.
- All answers and working must be written on the question paper in the spaces provided below each question.
- Show all the steps in your calculations, giving your answers at each stage in the spaces below each question.
- Marks may be given for correct working even if the answer is wrong.
- Non- programmable silent calculators and KNEC mathematical tables may be used except where stated otherwise.
- This paper consists 16 printed pages.
- Candidates should check the question paper to ascertain that all the papers are printed as indicated and that no questions are missing.

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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SECTION I (50 MARKS)

Answer ALL questions in this section in the spaces provided.

1. Evaluate without using tables or a calculator;

(2 marks)

$$1000 \frac{\frac{0.0128}{200}}$$

2. A wholesaler sold a radio to a retailer making a profit of 20%. The retailer later sold the radio for ksh. 1560 making a profit of 30%. Calculate the amount of money the wholesaler had paid for the radio.

(3 marks)

3. Given that $9^{2y} \times 2^x = 72$, find the value of x and y.

(3 marks)

4. Use logarithms, correct to 4 decimal places to evaluate.

$${}_3 \overline{1.794 \times 0.038}$$
$$1.243$$

(4 marks)

5. A line L passes through point (3, 1) and is perpendicular to the line $2y = 4x + 5$.

Determine the equation of the line L.

(3 marks)

6. A spherical ball is 15cm in diameter. What is its surface area?

(3 marks)

7. Simplify the expression:

$$\frac{16m^2 - 9n^2}{4m^2 - mn - 3n^2}$$

(3 marks)

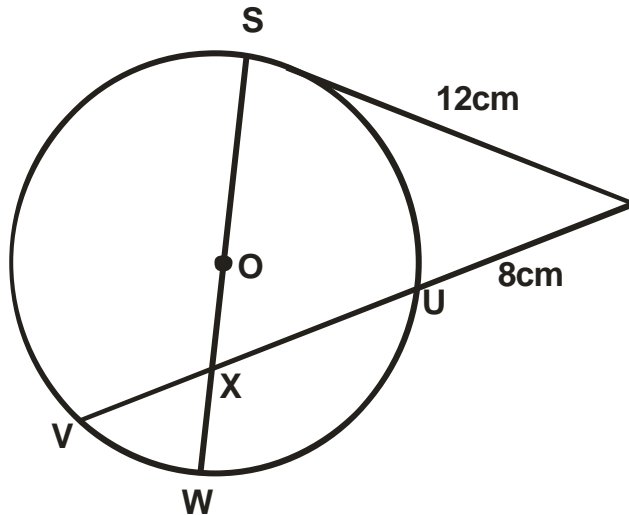
8. Given the inequalities $x - 5 \leq 3x - 8 < 2x - 3$, find the integral values of x .

(3 marks)

9. Triangle $A^1B^1C^1$ is the image of triangle ABC under the transformation represented by the

matrix $\begin{pmatrix} 3 & 1 \\ 5 & 4 \end{pmatrix}$. If the area of triangle $A^1B^1C^1$ is 140cm^2 , find the area of triangle ABC . (3 marks)

10. In the figure below, the tangent ST meets chord VU produced at T. Chord SW passes through the centre O, of the circle and intersects chord VU at X. Line ST = 12cm and UT = 8cm.



- a) Calculate the length of chord VU. (2 marks)
- b) If $WX = 3\text{cm}$ and $VX : XU = 2 : 3$, find SX. (2 marks)

11. The product of the matrices $\begin{pmatrix} 0 & 1 \\ 2 & P \end{pmatrix}$ and $\begin{pmatrix} -1.5 & -0.5 \\ P & P-2 \end{pmatrix}$ is a singular matrix, find the value of P.

(3 marks)

12. If $\frac{\sqrt{14}}{\sqrt{7}-\sqrt{2}} - \frac{\sqrt{14}}{\sqrt{7}+\sqrt{2}} = a\sqrt{7} + b\sqrt{2}$, find the values of a and b where a and b are rational numbers. (4 marks)

13. Without using a calculator, evaluate, giving your answer as a fraction in its simplest form

$$\frac{\frac{6}{7} \text{ of } \frac{14}{3} \div 80 \times \frac{-20}{3}}{-2 \times 5 + 14 \div 7 \times 3}$$

(3 marks)

14. On a certain day, the probability that it rains is $\frac{1}{7}$. When it rains, the probability that Mukai carries an umbrella is $\frac{2}{5}$. When it does not rain the probability that Mukai carries an umbrella is $\frac{1}{6}$. Find the probability that Mukai carried an umbrella that day. (3 marks)

15. A Kenyan businessman bought goods from Japan worth 2950000 Japanese Yen. On arrival in Kenya a custom duty of 20% was charged on the value of the goods. If the exchange rates were as follows:

$$1 \text{ US dollar} = 118 \text{ Japanese Yen}$$

$$1 \text{ US dollar} = 76 \text{ Kenyan shillings}$$

Calculate the duty paid in Kenyan shillings.

(3 marks)

16. The size of an interior angle of a regular polygon is $6\frac{1}{2}$ times that of an exterior angle.

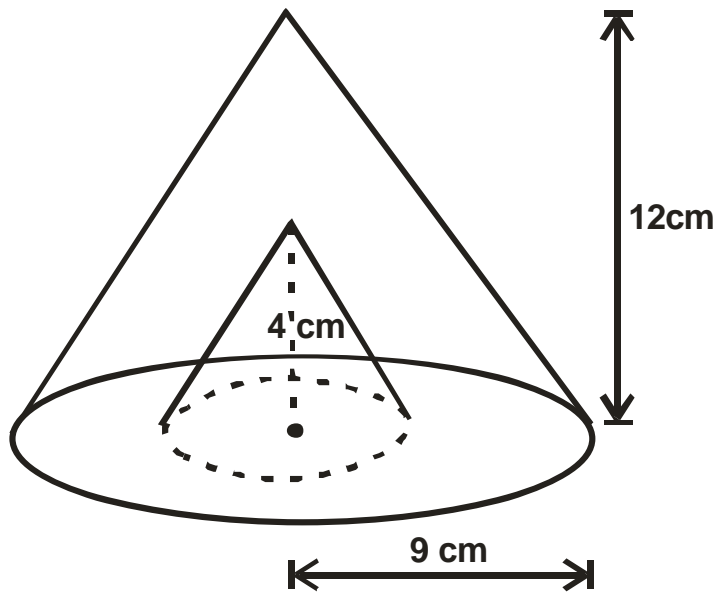
Determine the number of sides of this polygon.

(3 marks)

SECTION II (50 MARKS)

Answer any FIVE questions from this section.

17. The figure below represents a cone of height 12cm and base radius of 9cm from which a similar smaller cone is removed, leaving a conical hole of height 4cm.



- a) Calculate:
- i) The base radius of conical hole. (1 mark)
- ii) The volume, in terms of π of the smaller cone that was removed. (2 marks)

b) i) Determine, slant height of the original cone.

(1 mark)

ii) Calculate, in terms of π , the surface area of the remaining solid after the smaller cone is removed.

(5 marks)

18. a) Solve the equation, $\frac{x + 3}{24} = \frac{1}{x - 2}$

(4 marks)

b) The length of a floor of a rectangular hall is 9m more than its width. The area of the floor is 136m^2

i) Calculate the perimeter of the floor.

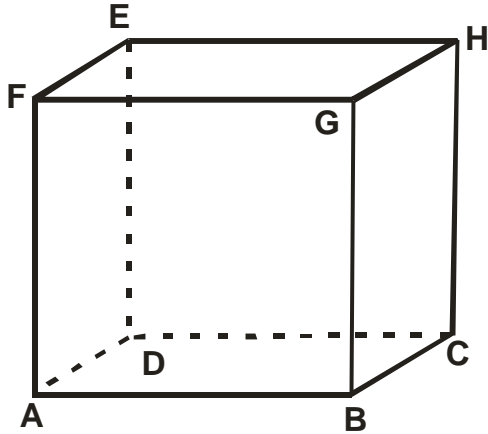
(4 marks)

ii) A rectangular carpet is placed on the hall leaving an area of 64m^2 . If the length of the carpet is twice its width, determine the width of the carpet.

(2 marks)

19. The figure below represents a solid cuboid ABCDEFGH with a rectangular base.

$AC = 13\text{cm}$, $BC = 5\text{cm}$ and $CH = 15\text{cm}$.



- a) Determine the length of AB. (1 mark)
- b) Calculate the surface area of the cuboid. (3 marks)
- c) Given that the density of the material used to make the cuboid is 7.6g/cm^3 , calculate its mass in kilograms. (4 marks)
- d) Determine the number of such cuboids that can fit exactly in a container measuring 1.5m by 1.2m by 1m. (2 marks)

20. A motorist left Embu for Nairobi, a distance of 240km, at 8.00a.m and travelled at an average speed of 90km.h. Another motorist left Nairobi for Embu at 8.30a.m and travelled at 100km/h. Find:

a) The time they met.

(6 marks)

b) How far they met from Nairobi.

(4 marks)

21. The table below shows the heights, measured to the nearest cm, of 101 pawpaw trees.

Height (cm)	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59
Frequency	2	15	18	25	30	6	3	2

- a) State the modal class. (1 mark)
- b) Calculate to 2 decimal places:
- i) The mean height (4 marks)
- ii) The difference between the median height and the mean height. (5 marks)

22. In a triangle ABC, $BC = 8\text{cm}$, $AC = 12\text{cm}$ and angle $ABC = 120^\circ$

a) Calculate the length of AB, correct to one decimal place

(4 marks)

b) If BC is the base of the triangle, calculate correct to one decimal place:

i) The perpendicular height of the triangle.

(2 marks)

ii) The area of the triangle.

(2 marks)

iii) The size of angle ACB

(2 marks)

23. A trader bought 2 cows and 9 goats for a total of ksh. 98,200. If she had bought 3 cows and 4 goats, she would have spent ksh. 2200 less
- a) Form two equations to represent the above information. (2 marks)
- b) Use matrix method to determine the cost of a cow and that of a goat. (4 marks)
- c) The trader later sold the animals she had bought making a profit of 30% per cow and 40% per goat.
- i) Calculate the total amount of money she received. (2 marks)
- ii) Determine, correct to 4 significant figures the percentage profit the trader made from the sale of the animals. (2 marks)

24. The displacement, S metres of a moving particle from point O , after t seconds is given by:

$$S = t^3 - 5t^2 + 3t + 10$$

a) Find S when $t = 2$ (2 marks)

b) Determine:

i) The velocity of the particle when $t = 5$ sec (3 marks)

ii) The value of t when the particles is momentarily at rest . (3 marks)

c) Find the time, when the velocity of the particle is maximum. (2 marks)