

Name Adm. No.

School Candidates signature

121

Date

MATHEMATICS

October/November 2015

Time 2½ hours

**KANDARA SECONDARY SCHOOLS FORM TWO
JOINT EXAMINATION
MATHEMATICS**

Paper - 121/1

October/November 2015

Time: 2½ hours

INSTRUCTIONS TO CANDIDATES

1. Write your name and Admission number in the spaces above.
2. Sign and write the date of the examination in the spaces provided above.
3. This paper contains two sections. Section I and II.
4. Answer all questions in section I and 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 calculations giving your answer at each stage in the spaces provided below each question.
7. Marks may be awarded for correct working even if the answer is wrong.
8. Non-programmable silent calculators may be used and KNEC Mathematical tables may be used, except where stated otherwise.

EXAMINER'S USE ONLY

Section I

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

Section II

Question	17	18	19	20	21				TOTAL
Marks									

Grand Total

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*This paper consists of 12 printed pages
Candidates should check the question paper to ensure that all the
printed pages are printed as indicated and no questions are missing.*

SECTION I (50 MARKS)

Answer all the questions in this section in the spaces provided.

1. Use logarithm and cosine tables to find the value of x in $\cos x = \sqrt{\frac{3861 \times 7.28}{4135}}$ (4 marks)

2. Write the expression $\frac{6}{3x-y} - \frac{2}{x-2}$ as single fraction in the simplest form. (3 marks)

3. The ratio of John's earning to that of James is 5 : 3. If John's earnings increased by 12% his new earnings becomes Kshs 5600. Find the corresponding percentage in James' earnings if the sum of their new earnings is Kshs 9600. (3 marks)

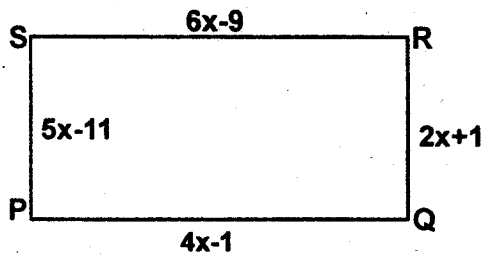
4. Without using tables or calculator evaluate $\frac{27.72 \times 0.3876}{2.09 \times 0.4284}$ (3 marks)

5.a) Find the gradient of a straight line joining the points P(2, 3) and Q(8, -6) (1 mark)

b) Hence find the equation of the line through P perpendicular to line PQ (3 marks)

6. Evaluate $\frac{\tan 30^\circ \cdot \sin 60^\circ - \sin 45^\circ \cdot \cos 45^\circ}{\cos 30^\circ \cdot \tan 60^\circ + \sin 30^\circ \cdot \tan 45^\circ}$ without using tables (3 marks)

7. The figure shows a rectangle PQRS in which all dimensions are given in centimetres. Find the value of x and hence calculate the area of the rectangle. (3 marks)



8. Find the value of n in the following equation. $\left(\frac{1}{27}\right)^n \times (81)^{-1} = 243$ (3 marks)

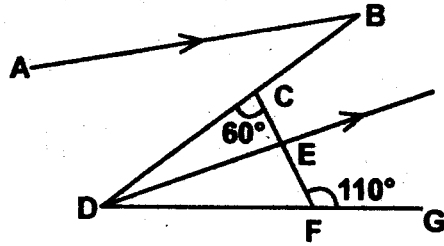
9. Express $0.\dot{2}\dot{7}$ as a fraction. (2 marks)

10. The size of an interior angle of a regular polygon is $3x^\circ$. While its exterior angle is $(x - 20)^\circ$. Find the number of sides of the polygon. (3 marks)

11. The angle of elevation of the top of a cliff from a point P is 45° . From a point Q which is 10m from P towards the foot of the cliff, the angle of elevation is 48° . Calculate the height of the cliffs. (4 marks)

12. It takes 30 workers 6 days working 8 hours a day to harvest maize in a farm. How many days would 50 workers working 6 hours a day take to harvest the maize. (2 marks)

13. In the figure below, AB is parallel to DE, bisects angle BDG, angle BCF = 60° and angle CFG = 110°.



Find

a) $\angle CDF$

(2 marks)

b) $\angle ABD$

(1 mark)

14. Find the difference between the LCM and the GCD of 12, 18 and 36.

(3 marks)

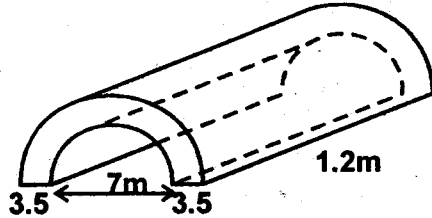
15. The total surface area of an open cylindrical container is 594cm^2 . If the diameter of the container is 14cm. Find its height in centimetres. ($\pi = \frac{22}{7}$) (3 marks)

16. In a school prize giving meeting there were 240 women and half as many men. There were twice as many children as adults. How many people were in the meeting all together. (4 marks)

SECTION II (50 marks)

Answer ALL the questions in the spaces provided.

17. a) The diagram below represents a solid made by removing a small semi-circle of diameter 7cm from a larger semi-circle of diameter 14cm. The shaded part represents the cross section of the solid which is 1.2m long. What is the volume of the solid in cubic centimetres? (5 marks)
(Take $\pi = \frac{22}{7}$)



- b) If the density of the solid is 7.5 g/cm^3 , Determine its mass in Kg. (3 marks)

- c) If the cost per kilogram is shs 200. Determine the cost of buying the solid. (2 marks)

18. The frequency distribution table below represents the number kilograms of meat sold in a butchery.

Mass in kg	1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	26 - 30	31 - 35
Frequency	2	3	6	8	3	2	1

a) State the modal class.

(1 mark)

b) Calculate the mean mass.

(5 marks)

c) Calculate the median mass.

(4 marks)

19. Four R, T, K and G are such that T is 84km directly to the North of R, and K is on a bearing of 295° from R at a distance of 60km. G is on a bearing of 340° from K and a distance of 30km. Using a scale of 1cm to represent 10km, make an accurate scale drawing to show the relative positions of the towns. (4 marks)

Find:

- a) The distance and the bearing of T from K.

(2 marks)

- b) The distance and the bearing of G from T.

(2 marks)

- c) The bearing of R from G.

(2 marks)

20. In this question use a ruler and a pair of compasses only.

a) Construct a triangle KLM in which angle $KML = 45^\circ$. $KM = KL = 6\text{cm}$. Measure ML. (4 marks)

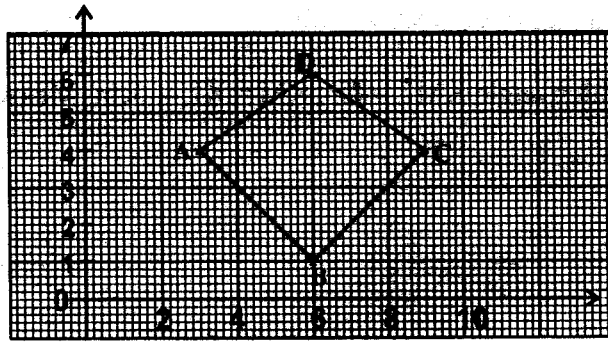
b) Bisect the angle KML. (1 mark)

c) On the same diagram construct a perpendicular bisector of KM. Extend the bisector of KM to meet the angle KML bisector at X. Measure KX. (2 marks)

d) Measure the distance XY where Y is the mid-point of the line KM. (1 mark)

e) Calculate the area of triangle KYX. (2 marks)

21.



Use the figure above to determine:

a) AC

(2 marks)

b) $2AD + 3BC$

(3 marks)

c) $\frac{1}{2}AB - 4DC$

(3 marks)

d) Length of BC

(2 marks)