NAME: …………………………….……………………. INDEX NO:..…...…………………….

SCHOOL: ………………………………………………. Candidate's signature: ……………...

Date: …………...………………………

121/1
MATHEMATICS
Paper 1
July/August
2 ½ Hours

LOWER YATTA DISTRICT JOINT EVALUATION EXAM - 2011
Kenya Certificate of Secondary Education (K.C.S.E)

121/1
MATHEMATICS
Paper 1
July/August
2 ½ Hours

INSTRUCTIONS TO CANDIDATES

(a) Write your name and index number in the spaces provided above.

(b) Write the date of examination in the spaces provided above.

(c) This paper consists of **TWO** sections. Section I and Section II.

(d) Answer **ALL** the questions in section I and only **FIVE** questions from Section II

(e) All answers and working must be written on the question paper in the spaces provided below each question.

(f) Show all the steps in your calculations, giving your answers at each stage in the spaces below each question.

(g) Marks may be given for correct working even if the answer is wrong.

(h) Non- programmable silent calculators and KNEC mathematical tables may be used except where stated otherwise.

(i) This paper consists 16 printed papers.

(j) 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 1

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

1. Evaluate;

(4 Marks)

2. Simplify.

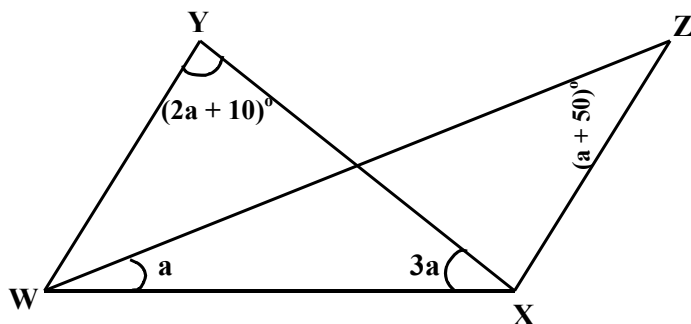—— - ——

(3 Marks)

3. Three business partners John, Jane and Joyce share Ksh.14,800 in the ratio 5 : 12 : X respectively. If John received Ksh.2,000, determine the amount of money received by each. (4 Marks)

4. Find the difference in the net price of an article marked Ksh.6,500 if the discount is changed from 9¾ % to 11½ %. (3 Marks)

5. In the figure below; <YXZ = 2<YWZ. Find the value of a. (3 Marks)

6. The line y = -2x + 3 intersects the line 2y = -3x + 10 at a point A. Find the co ordinate of point A. (4 Marks)

7. The wheel of a bus has a radius of 49cm and the bus is travelling at a speed of 80km/h. Determine the number of revolutions per minute the wheel is making. (3 Marks)

8. Two Matatus M and N are moving towards each other on a straight East-West main road. At a particular instant another Matatu P on another road is 60km south of the main road and the bearings of M and N from P are 330° and 60° respectively. How far apart are M and N? (3 Marks)
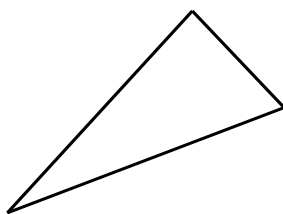
9. Solve the equation;

    $(p + 1)^2 + 3p - 1 = 0$ (3 Marks)

10. The radius of a soap bubble increases by 4%. Calculate the percentage increase in its volume to four significant figures. (3 Marks)
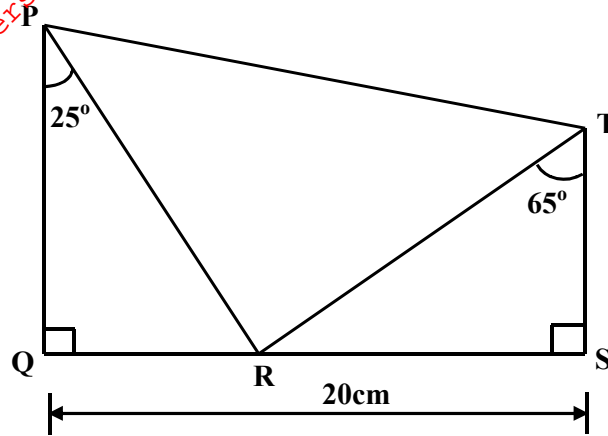
11. A point C (4, 1) has its image (7, 1) following an enlargement, scale factor 1½. Calculate the centre of enlargement. (3 Marks)

12. The figure below is part of a symmetrical figure and has a rotational symmetry of order 5 and the point of symmetry is shown. Complete the figure. (1 Mark)

13. The figure below QS = 20cm, TS = 7cm, <RTS = 65° and <QPR = 25°. Find the length of PT. (3 Marks)

14. Solve the following equation; (3 Marks)

$$x + \dfrac{\quad}{\quad} = 9$$

15. A bus left Nairobi at 6.00Am and travelled towards Mombasa at an average speed of 70km/h. A second bus left Mombasa at 7.00Am and travelled towards Nairobi at 80km/h. if thedistance between Nairobi and Mombasa is 500km. Find;

a) The time at which the two buses met. (2 Marks)

b) The distance of the meeting point from Nairobi. (2 Marks)

16. Find the standard deviation of the following set of numbers.

2, 7, 8, 4, 7, 5, 11, 3, 7. (3 Marks)

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SECTION II (50 MARKS)
Answer <u>ANY</u> five questions from this section.

17. Three brothers Robert, Peter and Simon decided to buy a plot. The plot owner offered the plot at ksh.3.0 million but agreed to be paid 65% of the value as initial deposit in the ratio 5:3:2 respectively and the remaining amount be paid after 2 years including an additional 5% of the initial value for processing the plot documents. The total balance was to be paid in the same ratio as the deposit.

   a) How much of the deposit did each contribute?   (6 Marks)

   b) What amount of money were the brothers to pay at the end of 2 years?   (2 Marks)

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c) How much of the total value did Simon pay? (2 Marks)

18. The raw marks scored by a group of students in a mathematics class were recorded as follows.

25	45	23	64	40	25	44	60	22
30	36	24	34	38	74	48	74	41
50	47	67	37	41	52	70	29	50
70	52	35	52	55	37	62	30	63
77	38	73	64	72	38	48	39	67

a) Taking 20 as the lower class limit of the first class and a class width of 5, make a frequency distribution table. (3 Marks)

b) i) State the modal class. (1 Mark)

ii) Determine the class in which the median mark lies. (1 Mark)

c) Using an assumed mean of 47, calculate the mean mark.   (5 Marks)

19. During the year 2008, Mutua had forty more goats than sheep and half as many cows as sheep. In the year 2009 his goats increased by 50% his cows decreased by 10% and his sheep increased by 20%. At the end of 2009 all his animals were 690. Calculate to the nearest whole number the percentage increase in the number of his animals during the year 2009.   (10 Marks)

20. a) The points A (3, 4) B(1, 1) and C(3,1) are the vertices of triangle ABC. On graph paper plot the points A, B,C and hence draw the triangle. (2 Marks)
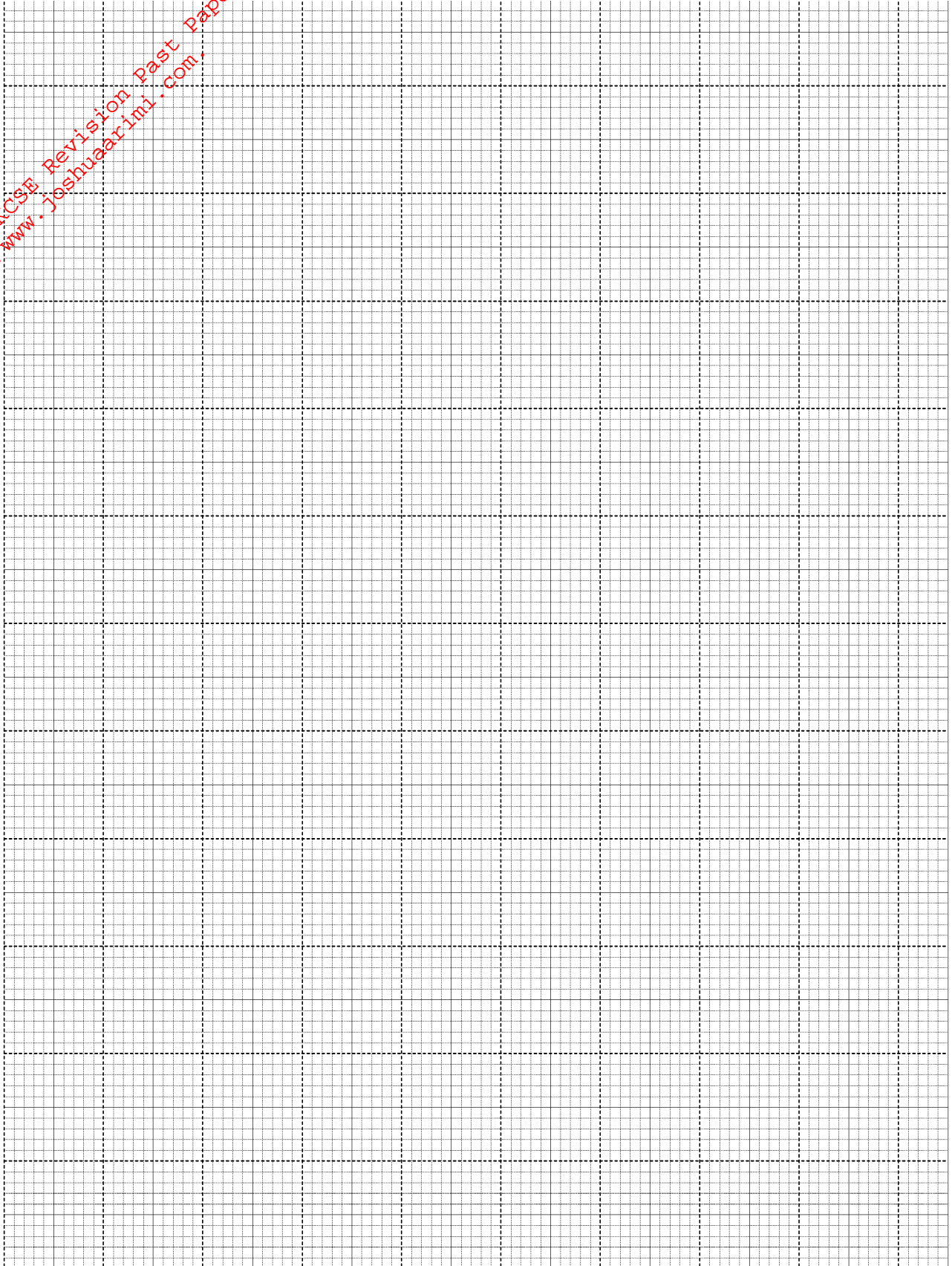
b) Triangle $A^1B^1C^1$ is the image of triangle ABC under an enlargement centre the origin and scale factor 2. On the same grid draw triangle $A^1B^1C^1$ and state its vertices' coordinates. (3 Marks)

c) Locate and write down the coordinates of the points A^{11}, B^{11}, and C^{11} the image of $A^1B^1C^1$ under a rotation of positive 90° about the origin. On the same grid plot the points A^{11}, B^{11} and C^{11} and hence draw triangle $A^{11}B^{11}C^{11}$. (3 Marks)

d) The points A^{111} (-8, -6), B^{111} (-2, -2) and C^{111}(-2, -6) are the images of A^{11} B^{11} and C^{11} under a given transformation T. Draw triangle A^{111} B^{111} C^{111} on the same grid and describe transformation T. (2 Marks)

21. The figure below shows a circle centre O and radius R cm. The minor arc AB subtends an angle 105° at the centre of the circle and the corresponding sector AOB has an area of 528cm². (Take Π = —)
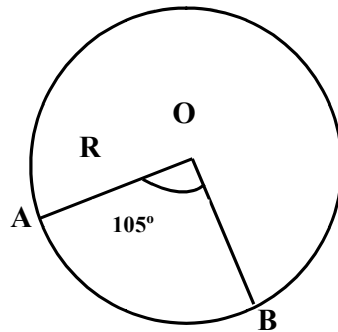
a) Find the radius R of the circle. (3 Marks)

b) The minor sector is removed and the major sector folded into a cone, calculate
   i)   The radius of the base of the cone formed to the nearest cm.   (2 Marks)

   ii) The height of the cone to 2 decimal places.   (3 Marks)

   iii) To the nearest whole number the volume of the cone.   (2 Marks)

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22. a) Find the area in hactares of the farm whose measurements are shown in the field book as in the table below. XY = 500m. (7 Marks)

	Y	
	Y	
To B 100	450	
	300	20 to C
	120	70 to D
To A 40	60	
	X	

b) Draw the map of the above 22(a) farm to scale of 1cm to 60m. (3 Marks)

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23. The position vectors of A, B and C are 2i – j, 3i + 2j and 3i + 4j respectively.

   a) Find i) $\left|\overrightarrow{AB}\right|$ (2 Marks)

          ii) $\left|\overrightarrow{BC}\right|$ (2 Marks)
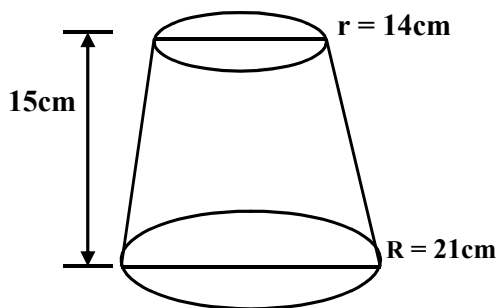
          iii) $\left|\overrightarrow{AC}\right|$ (2 Marks)

   b) Show whether triangle ABC is right angled.   (2 Marks)

   c) If P =   find the inverse of P.   (2 Marks)

24. The diagram represents a solid frustum with base radius 21cm and top radius 14cm. The frustum is 15cm high and is made of a metal whose density is 2g/cm³.

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a) Calculate;

    i)   The volume of metal in the frustum.   (5 Marks)

    ii)   The mass of the frustum in kilogrammes.   (2 Marks)

b) The frustum is melted down and recast into a solid cube. In the process 20% of the metal is lost. Calculate to 2 decimal place the length of each side of the cuble.   (3 Marks)

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