MUTUMO SUB-COUNTY KCSE REVISION MOCK EXAMS 2015

121/1
MATHEMATICS ALT A
PAPER 1
TIME: 2½ HOURS

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NAME _____ **INDEX NO.** _____

SCHOOL _____ **SIGNATURE** _____

DATE _____

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MUTOMO SUB-COUNTY KCSE PACESETTER, 2015

Kenya Certificate of Secondary Education (K.C.S.E)

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INSTRUCTIONS TO CANDIDATES

a) Write your name and index number in the spaces provided above.
b) Sign and write the date of examination in the space 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 space 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 of **16** printed papers.
j) Candidates should check the question paper to ascertain that all the pages 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	

SECTION I (50 MARKS)

Answer ALL questions in this section in the spaces provided

1. Work out and give your answer in a simplified form.

   $\frac{2}{7}$ of $1\frac{3}{4}$ $\frac{6}{11} \times \frac{21}{12}$ - $3\frac{1}{4} \div 2\frac{1}{2}$ (3 marks)

2. Mutua wants to erect a fence around his house using posts. Whenever he uses 5, 8 or 10 posts along one side, he is always left with 2 posts. Find the number of posts Mutua has for one side of the fence.

   (3 marks)

3. A bus driver travelled the first 130km at an average speed at 65km/h. For the next three hours he travelled at an average speed of 50km/h. Find the average speed of 50km/h.

   Find the average speed for the whole journey. (4 marks)

4. Given that point A(-2, 4) B(3, 1) and C (13, -5), express AB and AC as column vectors and hence show that the point A, B and C are collinear. (3 marks)

5. Evaluate without using calculator:

$$\frac{-8+ -3 \times -3 \times -12 -(-4)}{-4+ -6 \div 2 \times 4}$$

(3 marks)

6. A solid metal sphere of radius 7.5cm is melted down and recast into a solid cylinder of height 15cm. In the process 4% of the metal is lost. Calculate:

a) In terms of π the volume of metal used to make the cylinder. (2 marks)

b) The radius of the cylinder

7. Given that x, y and z are integers and that $8 \leq x \leq 10$, $5 \leq y \leq 7$, $4 \leq z \leq 6$.

   Find the percentage error in $\frac{x+y}{z}$ (4 marks)

8. Katuku is three years younger than Mueni. Mwikali is 5years younger than the sum of the ages of Katuku and Mueni. The sum of the ages of the 3 girls is 41. Find the age of each girl. (3 marks)

9. Given that log3 = 0.4771, log5 = 0.6990 and log7 = 0.8451, find without using logarithm tables or a calculator the value of:

a) log 1575 (2 marks)

b) log 2205 (2 marks)

10. Use mathematical tables to find:

a) i) The square of 4.978. (1 mark)

ii) The reciprocal of 31.65 (1 mark)

b) Hence, evaluate to 4 significant figures the value of :

$4.978^2 - \frac{1}{31.65}$ (1 mark)

11. A curve whose gradient function is 3x2 -3 has its two stationary points, one at point (-1, 8) and the other at point (1, b). Find its equation and the value of b. (3 marks)

12. A number is formed by finding the difference between the products of prime numbers between 20 and 30 and that of prime numbers between 1 and 15. Find the number formed.
    Write the number in words. (3 marks)

13. Solve for x in the equation
    $\frac{6x-4}{3} - \frac{2x-1}{2} = \frac{6-5x}{6}$ (2 marks)

14. A rectangle which measures 48cm by 27cm has the same area as a square. Find which figure has the greater perimeter and by how much. (3 marks)

15. Find the value of t in the equation: (2 marks)

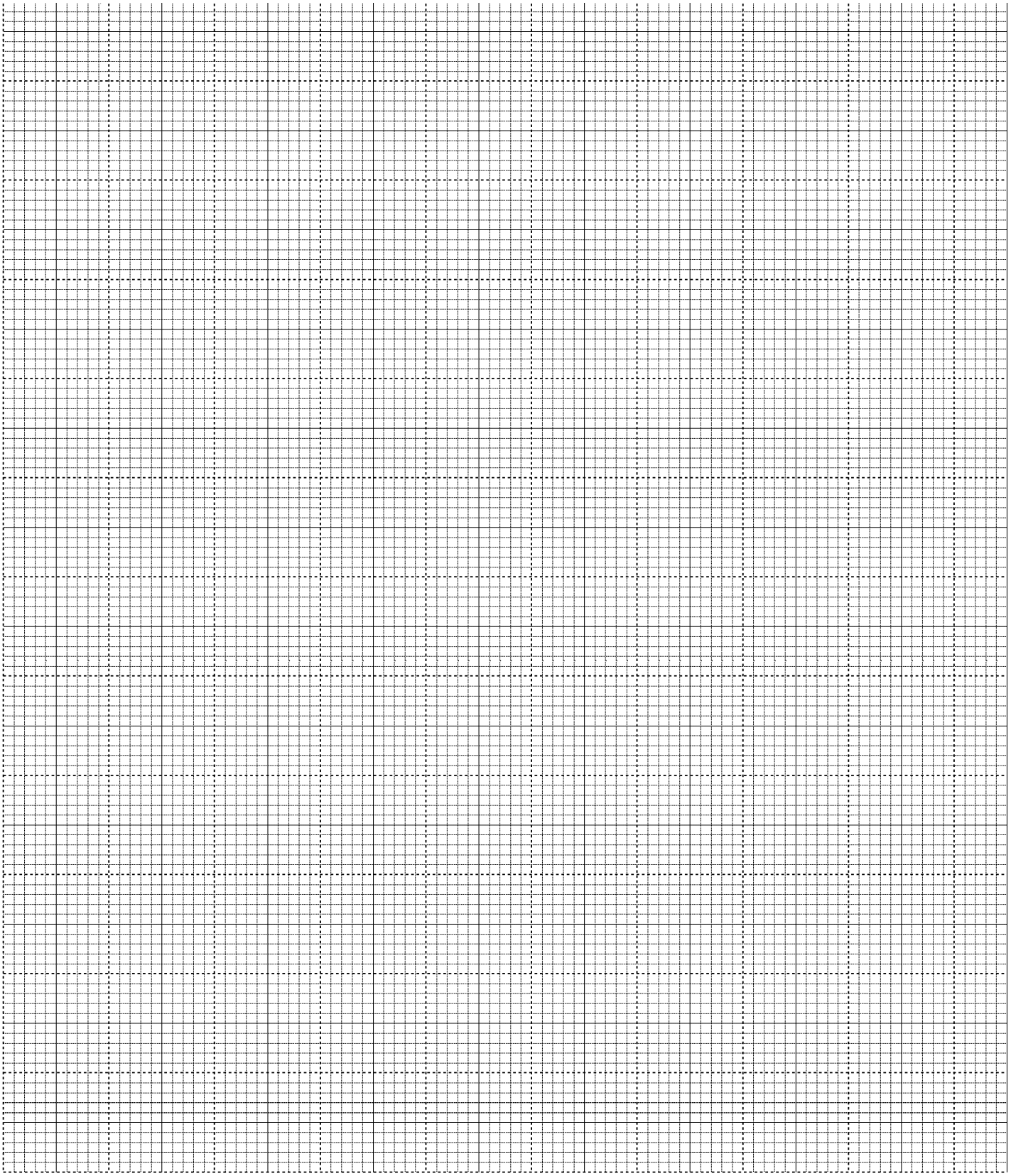
16. Find the range of value of x which satisfy the inequality below:

$\frac{1}{4}(2x - 1) < \frac{1}{4}(x + 3) < 3(x + 4)$ (3 marks)

SECTION B (50 MARKS)

Answer only five questions from in this section in the spaces provided

17. a) Draw the graph of $2x^2 + 3x - 6$ for the values of x from -3 to 3. (5 marks)



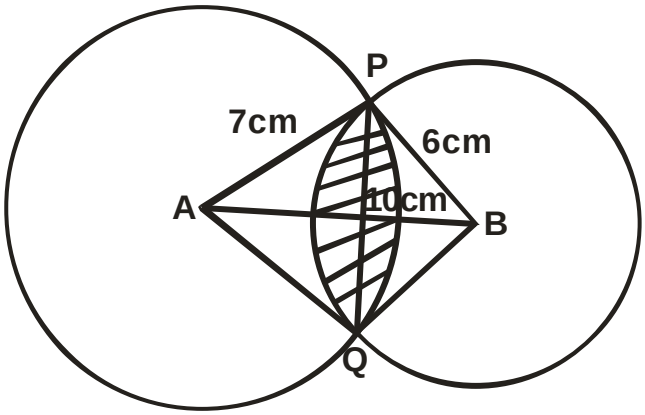
b) Use the graph to solve the equation:

i) $2x^2 + 3x - 6 = 0$ (1 mark)

ii) $2x^2 + 3x - 3 = 0$ (1 mark)

c) Solve the equation $2x + x - 7 = 0$ using the graph. (2 marks)

18. Find five significant figures the area of the shaded region in the figure below if the two circles with centres A and B have radii 7cm and 6cm respectively. The common chord PQ = 10cm.
(Take $\pi = 3.143$) (10 marks)



19. The displacement, s meters of a moving particle after t seconds is giving by:

    $S = 2t^3 - 5t^2 + 4t + 2$

    Determine:

a) The velocity of the particle when t = 3 seconds. (3 marks)

b) The value of t when the particle is momentarily at rest. (3 marks)

c) The displacement when the particle is momentarily at rest. (2 marks)

d) The acceleration of the particle when t = 3 seconds. (2 marks)

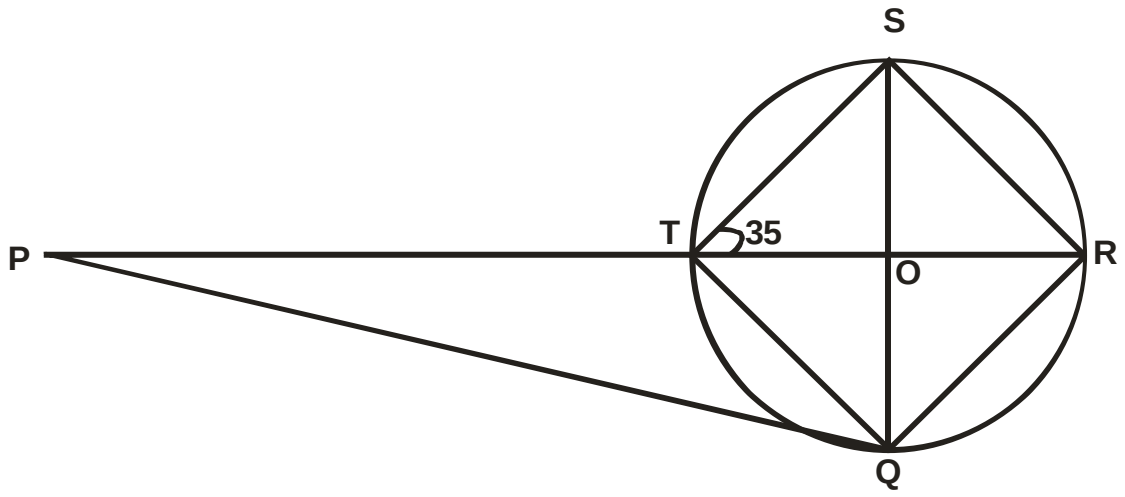
20. The table below shows a field book with measurements of a rice field. (AG = 250m)

a) Make a sketch drawing of the rice field. (3 marks)

	G	
	200	F 70
E 60	130	
	100	D 80
C 40	60	
	40	B 50
	A	

b) Find the area of the rice field in hectares. (7 marks)

21. The diagram below a circle, centre O. PQ is a tangent to the circle at Q and PTOR is a straight line. QRST is a cyclic quadrilateral in which angle RTS = 350 and RT and QS are diameters. Giving reasons for your answer, find the size of:



a) Acute angle ROS. (2 marks)

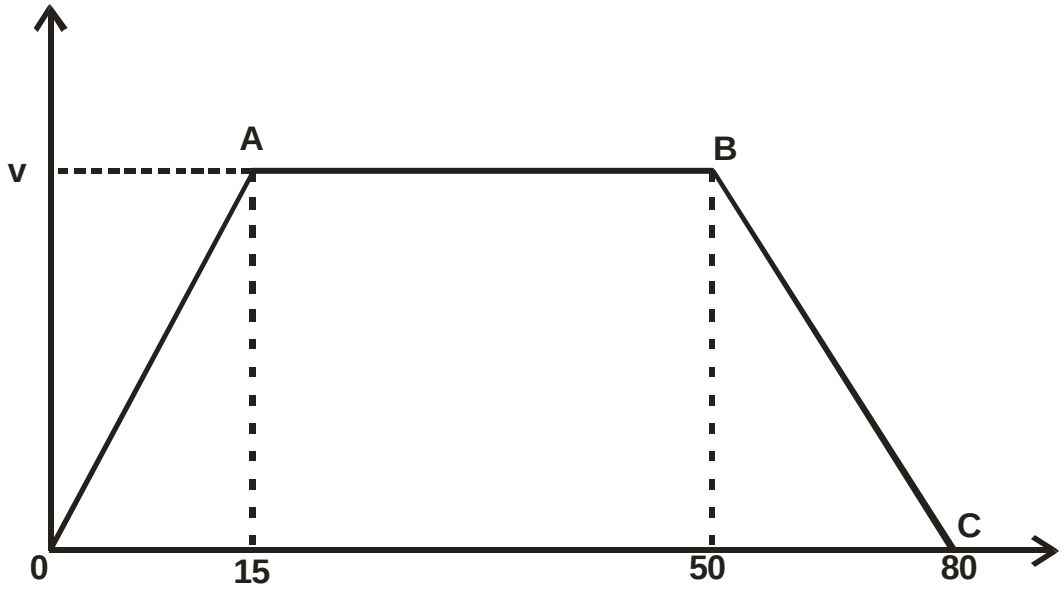
b) Angle RQS. (2 marks)

c) Angle PQR. (2 marks)

d) Angle QPT. (2 marks)

e) Angle PQT. (2 marks)

22. The figure below is the speed – time graph of a journey



If the total distance travelled in the 80 seconds is 920m, calculate:

a) The value of V. (4 marks)

b) The acceleration during the first 15 seconds (3 marks)

c) The distance travelled in the final 40 seconds. (3 marks)

23. Members of journalism club of Mbitini Girls School decided to buy a camera worth sh.4000. Each member set to contribute the same amount of money. Fifteen members failed to make their contributions as agreed. As a result each of the remaining members had to pay sh.60 more.

    If x represents the original number of members of the club:

a) Write an expression for:

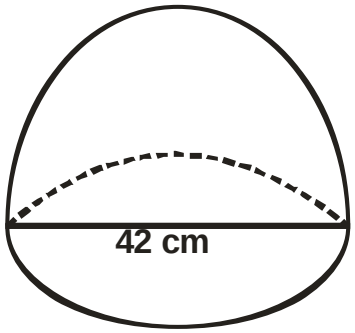
i) The amount of money each member was to contribute initially. (1 mark)

ii) The amount of money each member was to contribute after the addition sh. 60. (1 mark)

b) Calculate the number of members who eventually contributed for the camera. (4 marks)

c) Find the percentage increase in the contribution per member. (4 marks)

24. The diagram represents a solid hemispherical dome of diameter 42cm. The dome is painted on all faces at a cost of sh.500 per square meter and has a mass of 48.5kg.



Calculate:

a) The total surface area of the dome. (3 marks)

b) The cost of painting the dome. (2 marks)

c) The volume of the material making the dome. (3 marks)

d) The density of the material in kg/m^3 to 2 significant figures. (2 marks)