

Name: Adm No: Stream:

121/1

MATHEMATICS ALT A

Form 2

June 2018

$2\frac{1}{2}$ Hours

MARANDA HIGH SCHOOL

C . A . T TERM TWO 2018 EXAMINATIONS

MATHEMATICS ALT A

Form 2

$2\frac{1}{2}$ hour

Instructions to candidates

- Write your name, admission number and class in the spaces provided above.
- This paper consists of **TWO** sections: **Section I** and **Section II**.
- Answer **ALL** questions in section I and **FIVE ONLY** in 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 electronic calculators and KNEC Mathematical tables may be used except where stated otherwise.
- This paper consists of 14 printed pages.
- Candidates should check the question papers to ascertain that all the pages are printed as indicated and that no questions are missing.
- Answer all the questions in English.

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	Total

Grand
Total

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SECTION I (50 marks)

Answer all questions in this section in the spaces provided.

1. Evaluate

$$\frac{-8 \div 2 + 12 \times 9 - 4 \times 6}{56 \div 7 \times 2}$$

(3 marks)

2. The sum of four consecutive even numbers is 108. Find the numbers.

(3 marks)

3. Evaluate $\frac{\frac{1}{3} + \frac{1}{5} \div \frac{1}{2} \text{ of } \frac{1}{6}}{\frac{1}{4} \text{ of } \left(\frac{4}{5} - \frac{3}{4} + \frac{1}{2} \right)}$

(3 marks)

4. The equation of line L_1 is $2y + 3x = 1$, determine the gradient of the line hence or otherwise the acute angle it makes with the x-axis.

(3 marks)

5. Use tables of square roots, reciprocals and squares to evaluate

$$\frac{\sqrt{43}}{321} + 11.23^2$$

(4 marks)

6. Solve for x in the equation $3^{4x} \div \frac{1}{3^7} = 729$

(3 marks)

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5

7. A man is three times as old as his daughter. In twelve years to come he will be twice as old as his daughter. Find their present ages. (3 marks)

6

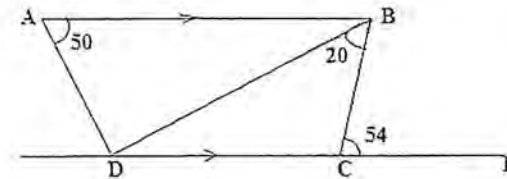
9. An artisan has 63kg of metal of density 7000kg/m^3 . He intends to use it to make a rectangular pipe with external dimension 12 cm by 15 cm and internal dimension 10 cm by 12 cm. calculate the length of the pipe in metres. (3 marks)

8. Use logarithm tables to evaluate

$$\sqrt[4]{\frac{37^2 \times 0.0168}{75.63}}$$

(4marks)

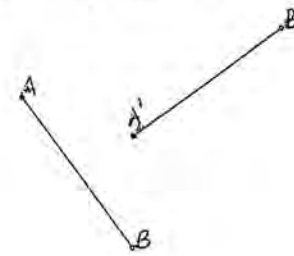
10. In the figure below, $\angle BAD = 50^\circ$, $\angle CBD = 20^\circ$, $\angle BCE = 54^\circ$ and AB is parallel to DE. Find the value of angle ADB. (4 marks)



11. A trader sold a wrist watch for sh. 3,150 after giving a 10% discount. Find the marked price of the watch. (2 marks)

12. The size of each interior angle of a regular polygon is five times the size of the exterior angle. Find the number of sides of the polygon. (3 marks)

13. Find by construction, the centre and the angle of rotation if $A'B'$ is the image of AB . (3 marks)



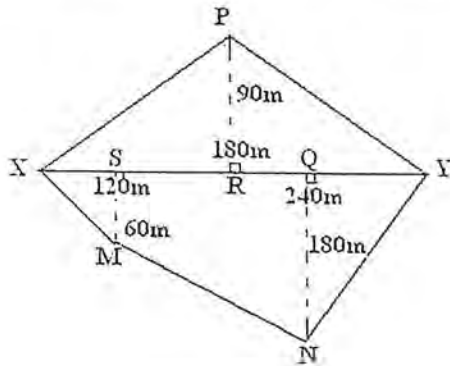
14. Solve for x given x is an acute angle and $\sin(x-15) = \cos 3x$.

(2 marks)

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15. A ladder 20 metres long leans against a building and reaches a point on the building that is 14 metres above the ground. Calculate the distance from the bottom of the building to the foot of the ladder. (3 marks)

16. The diagram below shows a sketch of a map of a field. Given that XY is the base line 360m and taking X as the starting point of the survey, enter the information given in a field book. (4 marks)



SECTION II (50 marks)

Answer all questions in this section in the spaces provided.

17. Four matatu operators John, Justus, Sylvanus and Victor decided to buy a minibus. They agreed to pay for the cost of the minibus in the ratio 3:4:5:6. Basing their calculations on the marked price of the minibus, they found that Sylvanus would pay Ksh 240,000 more than John. The sales agent however allowed them a 10% discount on cash payment.

(a) Calculate:

I. the marked price of the minibus

(2 mark)

II. the amount John and Justus combined paid more than Victor

(5 mark)

- (b) The four partners agreed to share monthly profit from the minibus in the ratio of their contributions after setting aside 25% of the profits for emergencies. If the minibus realized Kshs 64,000 during one month. Calculate Victor's share of the profits for that month (3 mark)

18. A bird flies from tree P to another tree Q which is 50m on a bearing of 030° from P. from Q the bird flies 80m due west to another tree R and finally flies due south to another tree S which is on a bearing of 120° from P.

a) Using the scale $1\text{cm} = 10\text{m}$, construct an accurate scale drawing showing the positions of P, Q, R, and S. (5 marks)

b) By measurement from your scale drawing determine;

i) the distance and bearing of R from Q (2 marks)

ii) the distance and bearing of S from R (2 marks)

iii) the distance of S from P (1 mark)

19. A farmer wanted to make a trough for cows to drink water. He had a metal sheet measuring 240cm by 120cm and 1cm thick. The density of the metal is 2.5g/cm^3 . A square of sides 30cm is removed from each corner of the rectangle and the remaining part folded to form an open cuboid.

a) Sketch the sheet after removing the squares for the four corners, showing all the dimensions. (2 marks)

b) Calculate:-

(i) The area of the metal which forms the cuboid. (2 marks)

(ii) The mass of the empty cuboid in kilograms. (3 marks)

c) The cuboid is filled with water whose density is 1g/cm^3 . Calculate the mass of the cuboid when full of water. (3 marks)

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20. The equations of the lines L_1 and L_2 are $y = -\frac{3}{4}x + 4$ and $y = -3 + 2x$ respectively.

a) Complete the tables below for the equations.

(2 marks)

$$y = -\frac{3}{4}x + 4$$

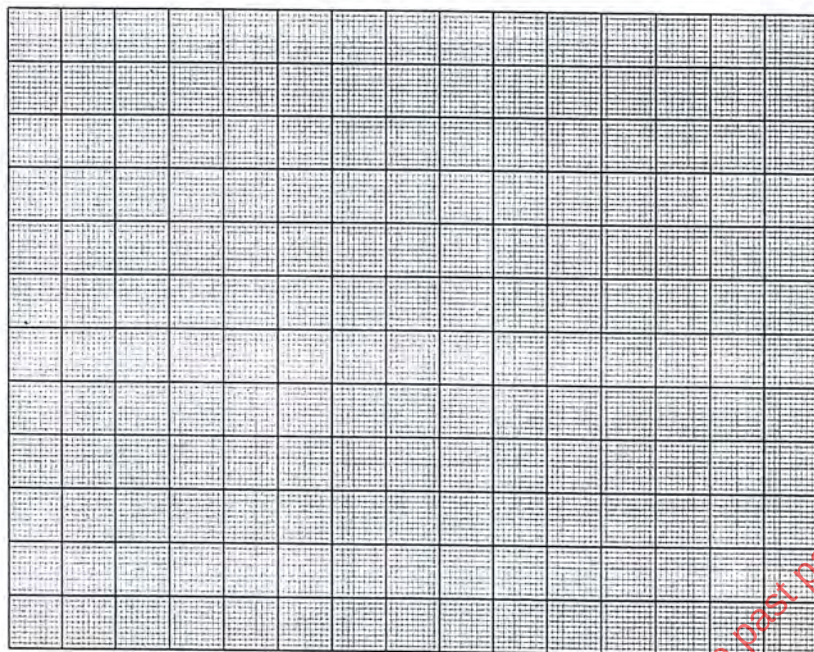
x	-2	0	2
y		4	

$$y = -3 + 2x$$

x	-2	0	2
y		-3	

b) On the grid draw lines $y = -\frac{3}{4}x + 4$ and $y = -3 + 2x$

(4 marks)



c) use your graphs to solve the simultaneous equations

$$\begin{aligned} 3x + 2y &= 8 \\ 2x - y &= 3 \end{aligned}$$

(1 mark)

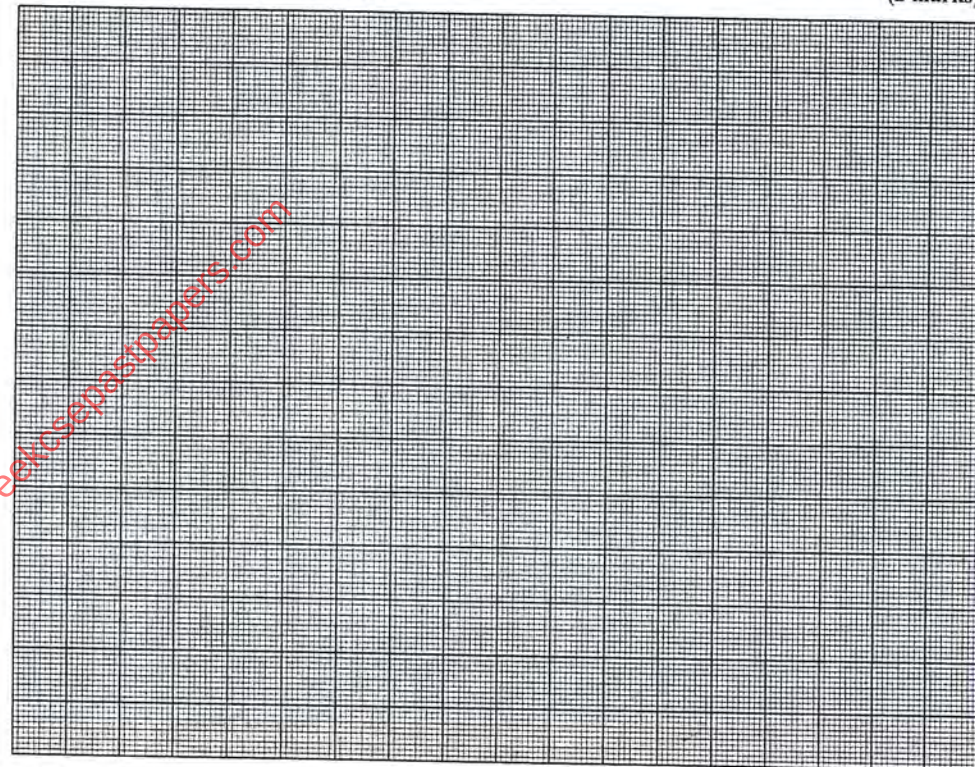
d) Determine the equation of line L_3 which is perpendicular to L_2 and passes through the origin.

(3 marks)

21. A triangle X with vertices $A(2,0)$, $B(4,2)$ and $C(0,3)$ is mapped to X^I with vertices $A^I(1,-3)$, $B^I(3,-5)$ and $C^I(4,-1)$ under rotation.

a) On the grid provided plot X and X^I .

(2 marks)



b) Locate the centre of rotation hence state its co-ordinates and angle of rotation of the transformation.

(3 marks)

c) Plot and state the co-ordinates of X^{III} image of X^{II} under reflection in the line $y=x+1$.

(3 marks)

d) From the graph identify any pair of triangles which are directly and indirectly congruent.

(2 marks)