

LOYOLA SECONDARY SCHOOL

2021 MALAWI SCHOOL CERTIFICATE OF EDUCATION MOCK EXAMINATIONS

MATHEMATICS

Subject Number: M131/I

Time Allowed: 2 hours
8:00-10:00am

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PAPER I

(100 marks)

Instructions

1. This paper contains 11 printed pages. Please Check
2. Answer all the 20 questions in this paper
3. The maximum number of marks for each answer is indicated against each question
4. Write your answers in the spaces provided on the question paper
5. Scientific calculator may be used
6. All working must be clearly shown
7. Write your full name/examination number at the top of each page of your question in the spaces provided
8. In the table provided on this page, tick against the question number you have answered.

Question Number	Tick if answered	Do not write in these columns	
1			
2			
3			
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Total			

STUDENT ID: _____

CLASS: _____

1. Factorize completely $a^2b + 3ab^2 - 2a - 6b$ (3marks)

2. Convert 334_5 to base 8 (5marks)

3. Given that $g(x) = ax - 2$. If $g\left(\frac{1}{2}\right) = 1$, find the value of a (4marks)



4. Solve for y in the equation $\log(2y - 3)_x + \log y_x = \log 20_x$ (6marks)

5. In a regular polygon, the exterior angle is $\frac{1}{5}$ th of the interior angle. Find the number of sides of the polygon (5marks)

6. Find the co-ordinates of the x-intercept of a line passing through $(3, -2)$ and $(1, -6)$ (5marks)

7. Given that $A = \begin{bmatrix} 2 & 4 \\ -1 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & -4 \\ 0 & -2 \end{bmatrix}$ and $C = \begin{bmatrix} -4 & 8 \\ -6 & 0 \end{bmatrix}$ simplify $B^2 + \frac{1}{2}C - A$ (6marks)

8. Table 1 shows tax rates

Amount	Tax rates
First K 100 000	Tax free
Next K 5 000	15%
Excess amount	25%

Mr Man receives a monthly gross salary of K210, 000. Calculate his monthly net salary (5marks)

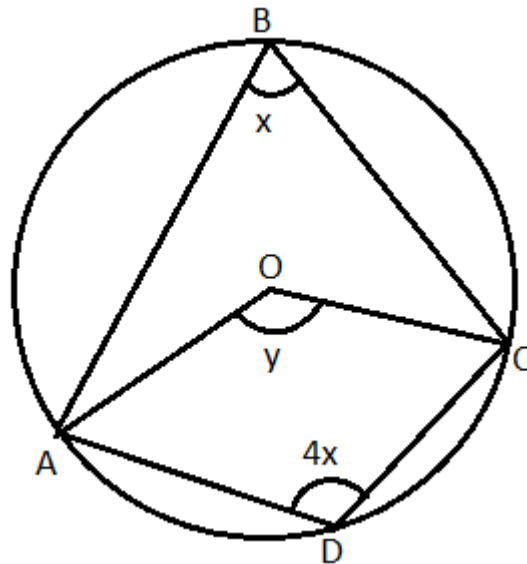
9. Without using a calculator simplify $\frac{2\sqrt{5}+2}{\sqrt{5}-1}$ leaving your answer with rational denominator (5marks)

10. Given that a triangle ABC has vertices $A(0, 1)$, $B(1, 2)$ and $C(2, 1)$. Using a scale factor of -2 and center of enlargement $(0, 0)$, draw on the graph paper provided, triangle ABC and its image $A'B'C'$ (6marks)

Place graph here

11. A beacon is 7 m away from the base of a flagpole of height 5.8 m. Calculate to nearest whole number, the angle of elevation of the top of the flagpole from the beacon (4marks)

12. Fig 1 shows a circle ABCD with center O, $\angle ABC = x$, $\angle AOC = y$ and $\angle ADC = 4x$



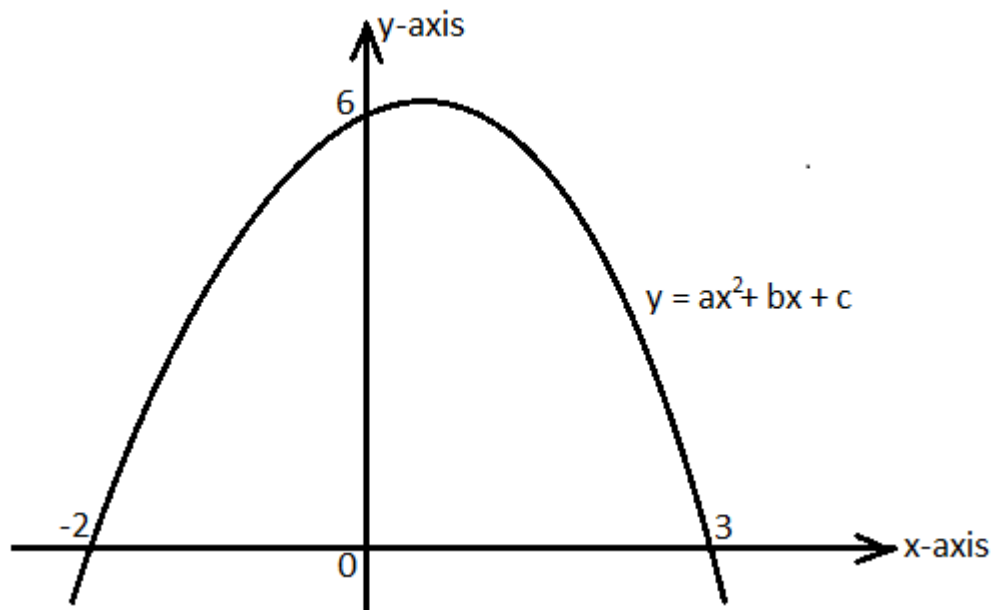
Calculate the value of y (5marks)

13. Make x the subject of the formula in $x + a = \frac{2x-5}{a}$ (5marks)
14. Given that P varies as x and inversely as the square-root of y . $P = 9$, $x = 12$ when $y = 4$. Find y when $P = 11.25$ and $x = 30$ (5marks)
15. Given that N is a set of natural numbers such that $N = \{x: 2 < x \leq 11\}$, $A = \{\text{factors of } 24\}$, $B = \{\text{prime numbers}\}$. Find $A' \cap B'$ (6marks)

16. In a certain mixture, rice A costing K 4 00 per Kg was mixed with rice B costing K 750 per Kg in the ratio $x : 7$. If one Kg of the mixture costs K 522.50, calculate the value of x (5marks)
17. On the same axes, sketch graphs to show the region bounded by the following inequalities, shade the unwanted region. (5marks)
- $$2y \geq x, \quad y + x > 2, \quad y \leq 2$$

18. Using a ruler and a pair of compasses only, construct an equilateral triangle ABC of side 7 cm. in the same diagram construct an inscribed triangle. Measure and state its radius. (5marks)
19. Given that the points $A(1, 7)$, $B(2, w)$ and $C(5, 19)$ are collinear, find the value of w (5 marks)

20. Fig 2 shows a curve $y = ax^2 + bx + c$ where a , b and c are constants.



Find the equation of the curve in the form $y = ax^2 + bx + c$ (5 marks)

END OF QUESTION PAPER!