

LILONGWE CITY MSCE MOCK EXAMINATION 2023 MALAWI SCHOOL CERTIFICATE OF EDUCATION

MATHEMATICS

Wednesday, 22 March

Subject Number: M131/I

Time Allowed: 2 hours 07:30 – 9:30 am

PAPER I

(100 marks)

Instructions

- 1. This paper contains 12 printed pages. Please check.
- 2. Answer all the twenty 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. Calculators may be used
- 6. All working must be clearly shown
- 7. Write your Name and School at the top of each page of your question paper.
- 8. In the table provided on the page, tick against the question number you have answered

Question	Tick if	Do not write in	
Number	answer	these columns	
1			
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Turn over

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1. Factorise completely	$12 - x - 6x^2$	(4 marks)

2. Without using a calculator, simplify, leaving your answer in rational form. (5 marks)

$$\frac{\sqrt{108} + \sqrt{48}}{\sqrt{150}}$$

3. Make g the subject of the formula

$$m = \frac{n}{2g^3 - C}$$

(4 marks)

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4.	Given that $\begin{bmatrix} 2\\ 3 \end{bmatrix}$		(5 marks)

5. Figure 1 shows two similar cylinders, A and B with heights 7cm and 3cm respectively. Use it to answer the question that follows:



Given that volume of cylinders **B** is 36 cm³, calculate volume of cylinder **A**, leaving your answer to significant figure. (5 marks)

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6. Figure 2 shows a circle PQRS, with centre O. PQ = 15 cm, RS = 14 cm and OM = 6 cm.

M and N are midpoints points of chords PQ and RS, respectively.



Calculate the value of **ON.**

(5 marks)

distance between them is 100m, calculate the height of the tower, without using a calculator. (6 marks)

8. Figure 3 shows a tangent ABC to a circle BCDEF at B. Angle DBA = 50° and DFC is a straight line.



(6 marks)

10. Figure 4 shows circle **ABCDE.** Angle $ACB = 30^{\circ}$ and angle **EDA** = 28°. **PAB** is a straight line.



Figure 4

Calculate the value of angle **PAE**.

(4 marks)

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11. On the same axes, sketch the graphs to show the region bounded by the following

inequalities:

$$x \ge 0$$
$$x - 2y \le -4$$
$$x + y \le 8$$

(Shade the unwanted region)



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12. Figure 5 shows a speed-time graph of a car.



Figure 5

Given that the total distance travelled is 320m, calculate:

(a) The Value of **V**.

(3 marks)

(b) The deceleration during the last 20 seconds.

(3 marks)

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13. A line parallel to the equation	on $2y - 5x - 7 = 0$ cuts the y-axis at	(0, -3). Find the
equation of the line.		(5 marks)

14. Given that two sets of numbers 2,3,5,7,7,8,10 and *x*,4,6,6,8,8 have equal mean, calculate the value of *x* have equal mean, calculate the value of *x*.

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15. Given that $h(x) = ax - bar bar bar bar bar bar bar bar bar bar$	2, find the value of a , given that $h\left(\frac{1}{2}\right) = 1$.	(4 marks)

16. Given that $-\binom{-2}{1} + \underline{q} = \binom{5}{3}$, find $|\underline{q}|$.

(5 marks)

17. A triangle PQR has vertices P(1,4), Q(-2,3) and R(1,-2). If triangle PQR is translated by 6 units to the left and 8 units upward, find the coordinates of the image of the triangle PQR. (5 marks)

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18. If 3k – 4, 4k – 2 and 10k –	- 2 are the first three terms of a GP, ca	lculate the possible
value of k .		(6 marks)

19. Given $(x + 2)^2(x + 1) \equiv Ax^3 + Bx^2 + Cx + D$, calculate the value of **C**. (4 marks)

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20. Solve the equation $2t^2 - 5t = 8$, giving the answer correct to 3 significant figures.

(6 marks)

END OF QUESTION PAPER

NB: This paper contains 12 printed pages.