



EXAMINATION NO.: _____

THE MALAWI NATIONAL EXAMINATIONS BOARD

2025 MALAWI SCHOOL CERTIFICATE OF EDUCATION EXAMINATION

MATHEMATICS**Subject Number: M131/II****Friday, 4 July****Time Allowed: 2 h 30 min
8:00 – 10:30 am****PAPER II
(100 marks)****Instructions**

1. This paper contains 19 printed pages. Please check.
2. Write your **Examination Number** at the top of each page of your question paper in the spaces provided.
3. Answer **all** the six questions in Section A and any **four** questions from Section B.
4. The maximum number of marks for each answer is indicated against each question.
5. Scientific calculators may be used.
6. The blank answer sheet at the end of the question paper can be used if required.
7. **All working must be clearly shown.**
8. In the table provided on this page, tick against the question number you have answered.
9. At the end of the examination, hand in your paper to the invigilator.

Question Number	Tick if answered	Do not write in these columns	
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
Total			



Section A (60 marks)

Answer all the six questions in this section in the spaces provided.

1. a. Without using a calculator, simplify $\frac{\sqrt{5} - 3\sqrt{3}}{2\sqrt{3} + \sqrt{5}}$, leaving the answer with a rational denominator. **(5 marks)**

- b. Express $\frac{x^2 - 9}{2x^2 + 3x - 9} \times \frac{6x^2 - 5x - 6}{9x^2 - 4}$ as a single fraction. **(4 marks)**

Continued/...

2. a. Factorise completely $2a^3 - 14a^2 + 24a$. (4 marks)

b. Given that $P = \{a, b, d, e\}$, $Q = \{b, d, e, f, g\}$ and $R = \{a, b, c, d\}$, show the three sets in a venn diagram. (4 marks)

Continued/...

3. a. The first and last terms of an Arithmetic Progression (AP) are – 12 and 40 respectively. If the sum of the AP is 238, calculate the number of terms. **(5 marks)**

Continued/...

3. (Continued)

- b. Prove that a tangent to a circle is perpendicular to the radius at the point of contact. (5 marks)

Continued/...

4. a. Table 1 shows class intervals of scores and their frequencies.

Table 1

Scores	1 - 9	10 - 18	19 - 27	28 - 36
Frequency	3	2	m	5

Given that the mean score is 20, calculate the value of m .

(6 marks)

Continued/...

4. (Continued)

b. Solve the following equations simultaneously

$$\begin{aligned}xy &= 15 \\y + 1 &= 2x\end{aligned}$$

(6 marks)

Continued/...

5. a. Figure 1 is a triangular prism in which $DA = 8 \text{ cm}$, $CD = 4 \text{ cm}$ and $FC = 6 \text{ cm}$.

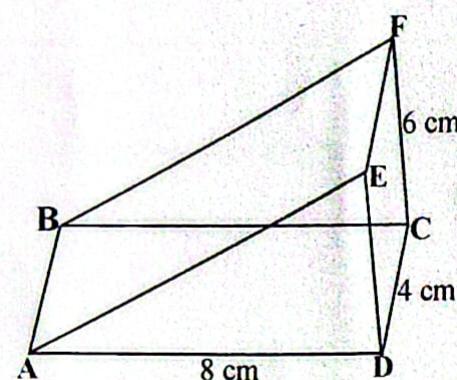


Figure 1

Calculate the angle between BE and face $ABCD$, giving the answer correct to the nearest degree. (6 marks)



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5. (Continued)

- b. Figure 2 shows a circle PQR centre O. RT is a tangent to the circle at R and TPMO is a straight line.

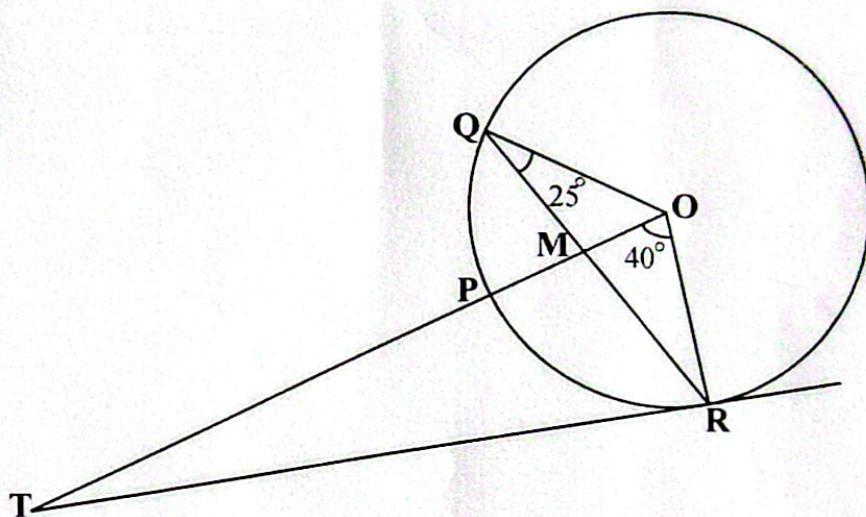


Figure 2

If angle $RQO = 25^\circ$ and angle $TOR = 40^\circ$, show that $RT = MT$.

(5 marks)

Continued/...

6. a. Given that $\overrightarrow{OX} = \begin{pmatrix} 1 \\ 3 \end{pmatrix}$, $\overrightarrow{OY} = \begin{pmatrix} 3 \\ 9 \end{pmatrix}$ and $\overrightarrow{OZ} = \begin{pmatrix} 5 \\ x \end{pmatrix}$, find the value of x if points X, Y and Z are collinear. (4 marks)

Continued/...

6. (Continued)

- b. Using a pair of compasses and a ruler only, construct in the same diagram:
- a circle centre **O** of radius 4 cm.
 - a tangent **AB** at **A** such that $AB = 8 \text{ cm}$.
 - a perpendicular bisector of line **OB** intersecting **AB** at **C**.
 - measure and state the length of **OC**. **(6 marks)**

Continued/...

Section B (40 marks)

Answer any **four** questions from this section in the spaces provided.

7. A quantity q partly varies as r and partly varies as the square of r . When $q = 33$, $r = 3$ and when $q = 168$, $r = 8$. Calculate the value of q when $r = 10$. **(10 marks)**

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2025

**EXAMINATION NO.: _____
Page 13 of 19 M131/II**

- 8.** Solve the equation $2^{2x} + 32 = 3(2^{x+2})$. **(10 marks)**



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9. A motorist drives from his home to work, a distance of 12 km on a bearing of 274° . He then proceeds to the market, a distance of 9 km on a bearing of 210° .

Calculate the:

- a. distance between his home and the market. (6 marks)

Continued/...

9. (Continued)

b. bearing of his home from the market.

(4 marks)

Continued/...

10. Given that $2y + 3$ and $y - 3$ are factors of a polynomial $4y^3 + by^2 + cy + 9$, calculate the values of b and c . **(10 marks)**

Continued/...

11. A letter posted in Majola city will be delivered in Zitheka city within two days. The probability of a letter reaching Zitheka city within the two days is $\frac{4}{5}$. Given that two letters are posted in Majola city, calculate the probability that:

a. only one arrives within two days. (6 marks)

b. none arrives within two days. (4 marks)

Continued/...

12. A boy wants to prepare 6 litres of local juice using two types of fruits: guavas and apples. A guava produces 0.3 litres and an apple produces 0.2 litres. He plans to use not less than 4 guavas to prepare the juice.

- a. Taking x to represent the number of guavas and y to represent the number of apples, formulate **three** inequalities in x and y that satisfy the above information. **(4 marks)**

- b. Using a scale of 2 cm to represent 1 unit on the horizontal axis and 2 cm to represent 2 units on the vertical axis, draw the graphs on the graph paper provided **on page 19** to show the region bounded by the **four** inequalities. Shade the unwanted region. **(5 marks)**
- c. Use the graphs to find the maximum number of apples that can be used to make the juice. **(1 mark)**

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END OF QUESTION PAPER

NB: This paper contains 19 printed pages.