



LOZI SECONDARY SCHOOL

2019 MALAWI SCHOOL CERTIFICATE OF EDUCATION MOCK EXAMINATIONS

MATHEMATICS

Monday 8th April, 2019

PAPER II

(100 marks)

Subject Number: M131/II

Time allowed: 2 hours

8:00 – 10:00 am

Instructions

1. This paper contains 12 printed pages. Please check.
2. Before beginning, fill in your **Examination Number** at the top of each page.
3. Use of electronic calculators is allowed.
4. All working must be clearly shown
5. The maximum number of marks for each answer is indicated against each question.
6. 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		Examiner's Name
1				JN
2				JN
3				JN
4				JN
5				JN
6				JN
7				JN
8				JN
9				JN
10				JN
11				JN
				JN



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Turn over



1. (a) Convert 1101_2 to base 3. [5 marks]

(b) Solve the equation $\log_9 27^k = k + 1$ [5 marks]

2. (a) Without using a calculator or four figure table, simplify $\sqrt{125} + \sqrt{5} - \sqrt{45}$, leave your answer in surd form. [3 marks]

(b) Suppose $y = (a + 1)x + 5$ and $y = -2x$ are two parallel straight lines, calculate the value of a .

[4 marks] Downloaded for FREE from www.kizitochikuni.com - For more info: contact@kizitochikuni.com



3. (a) Solve the equation $(2^x)^2 - 9(2^x) + 8 = 0$. [5 marks]

(b) If $f(x) = 8^x - 6$, find $f(\frac{2}{3})$. [4 marks]

(c) On the same axes, sketch the graph of the region described by the inequalities $y < 3$ and $y \geq x$.
[5 marks]

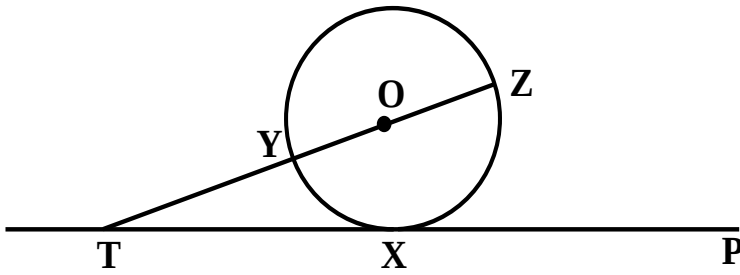


4. (a) Solve the equation $3^y = \frac{9^y}{81}$ [5 marks]

(b) Simplify $\frac{\sqrt{n^3} - \sqrt{9n}}{\sqrt{n}}$ in its simpler form. [4 marks]

5. (a) **XYZ** is a circle with centre **O**. **TXP** is a tangent to the circle at **X** and the diameter **ZY** produced meets the tangent at **T**.





If $\angle ZXP = 72^\circ$, calculate the value of the angle XTY. [5 marks]

(b) Find the sum of the first 20 terms of the AP 4, 2, 0, ... [4 marks]

(c) Solve the equation $x^2 + 8x = -9$ by completing the square. [5 marks]

6. (a) Express $\frac{K+3}{6} + \frac{3k+1}{3} - \frac{K-2}{6}$ as a single fraction. **[4 marks]**

(b) Rewrite $3^4 = 81$ in logarithmic. **[2 marks]**



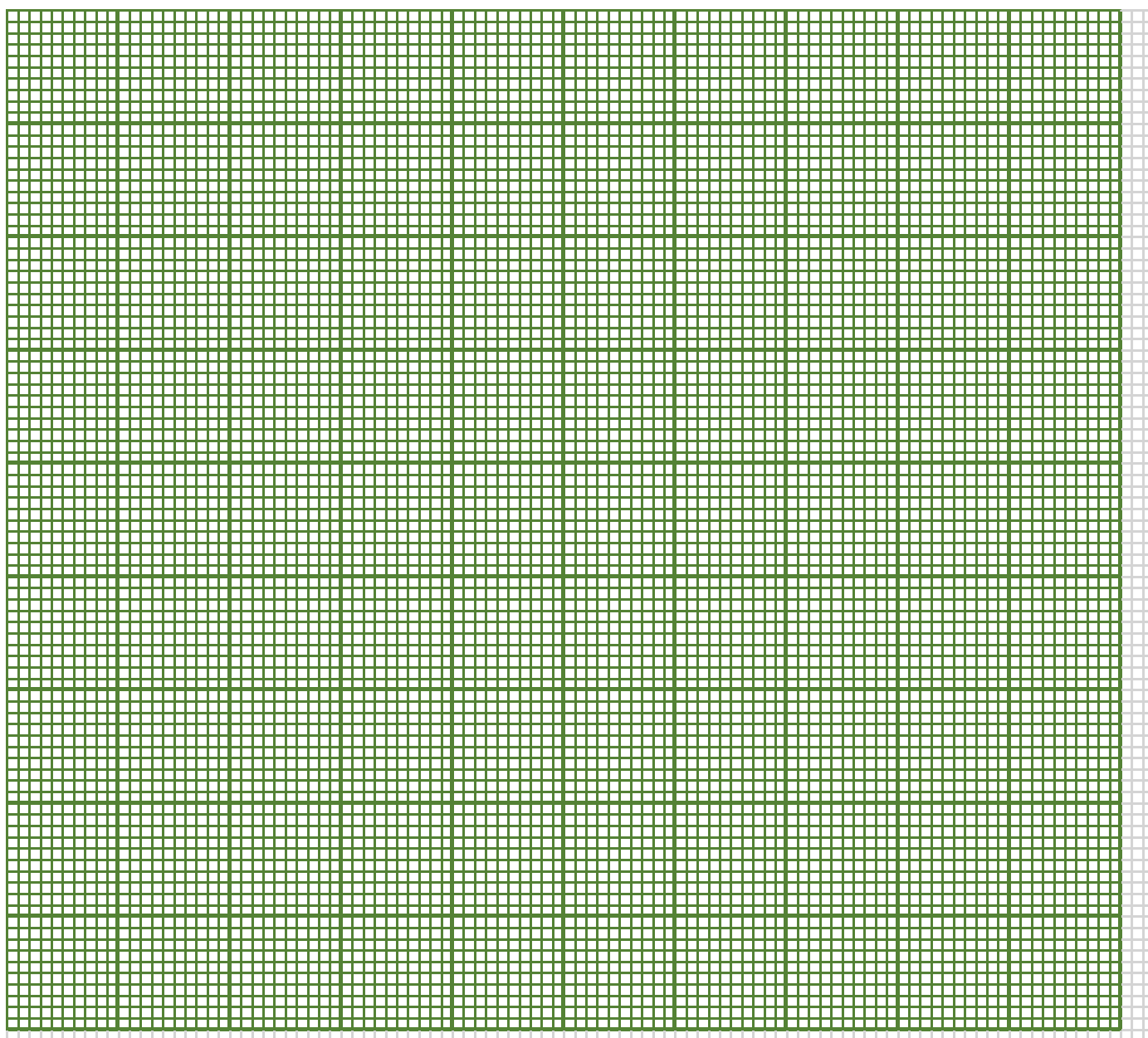
ANSWER THE FIRST QUESTION IN THIS SECTION AND ANY OTHER THREE.

7. The table shows some of the values of the equation $y = x^3 - 2x^2 - 5x + 6$ [10 marks]

X	-3	-2	-1	0	1	2	3	4
Y	-24		8		0	-4	0	18

i. Copy and complete the table

- ii. Using a scale of 2cm to represent 1 unit on the x-axis and 2cm represent 5 units on the y-axis, draw the graph of $y = x^3 - 2x^2 - 5x + 6$

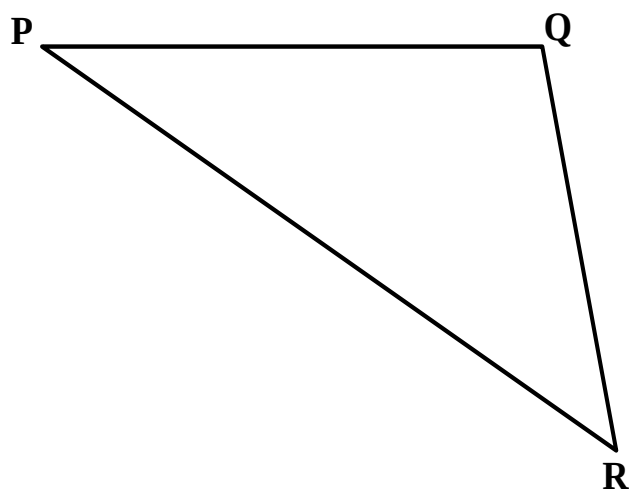


- iii. Use the graph to solve the equation $x^3 - 2x^2 - 5x + 4 = 0$

8. The general form of a quadratic equation is $ax^2 + bx + c = 0$, make x the subject of the formula. [10 marks]

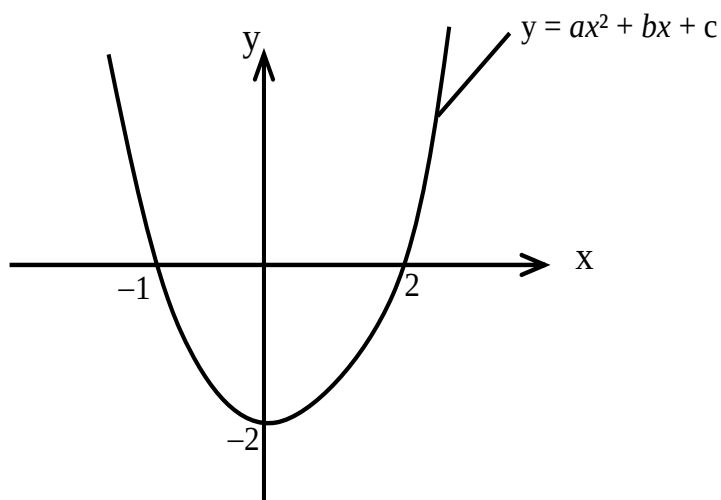


9. (a) The figure below shows a triangle PQR in which $PQ = 3\text{cm}$, $QR = 4\text{cm}$ and $PR = 5\text{cm}$. copy the figure and locate $\Delta P'Q'R'$, the image of ΔPQR under a rotation of 65° about point O . [8 marks]



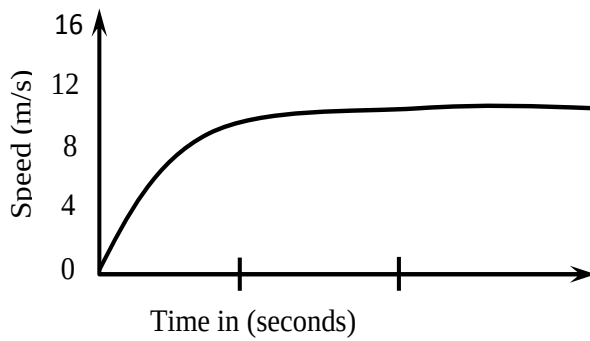
(b) If $f(x) = -3$ find $f(x) = 2x + 1$ [2 marks]

10. (a) The figure shows a graph of a quadratic equation $y = ax^2 + bx + c$



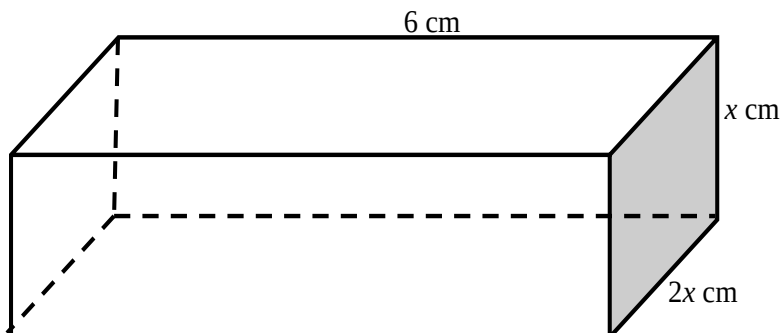
Find the quadratic equation for the graph in the form $y = ax^2 + bx + c$ [5 marks]

(b) The figure shows a speed – time graph for a particle during the first 20 seconds of its motion.



Calculate the particles average speed during the 20 seconds. [5 marks]

11. (a) The figure is a rectangular box with an open top. The box measures 6cm long, $2x$ cm wide and x cm high.



Given that the total given surface area of the box is 108 cm^2 , from an equation in x and show that it simplifies to $x^2 + 6x - 27 = 0$ [5 marks]

(b) Given that x varies as y and inversely as the square of Z , calculate the missing value in the table.
[5 marks]

X	Y	Z
3	1	2
1	3	

END OF QUESTION PAPER

NB: This paper contains 12 pages.

