MARANATHA ACADEMY

2023 MALAWI SCHOOL CERTIFICATE PRE-MOCK TEST

MATHEMATICS

18th April 2023 **Subject Number: M131**

Time allowed: 1 hour 20 min

13:00 – 14:20

TEST III

(50 Marks)

Instructions

1. **This paper has 8 printed pages. Please check.**
2. Fill in your **Candidate ID** at the top of each page.
3. Answer **all** the **5** questions in this paper.
4. The **maximum number of marks** for each correct answer is indicated against the question
5. **All work must be clearly shown in the space provided for each answer.**
6. In the space 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			
4			
5			

1. a) $P'(-3.2)$; $Q'(2,1)$ and $R'(-1,-3)$ are vertices of the image of triangle PQR under translation vector $\underline{n} = \begin{pmatrix} -2 \\ 3 \end{pmatrix}$. Find the vertices of triangle PQR.

(3 marks)

b) Figure 1 shows triangle RST.

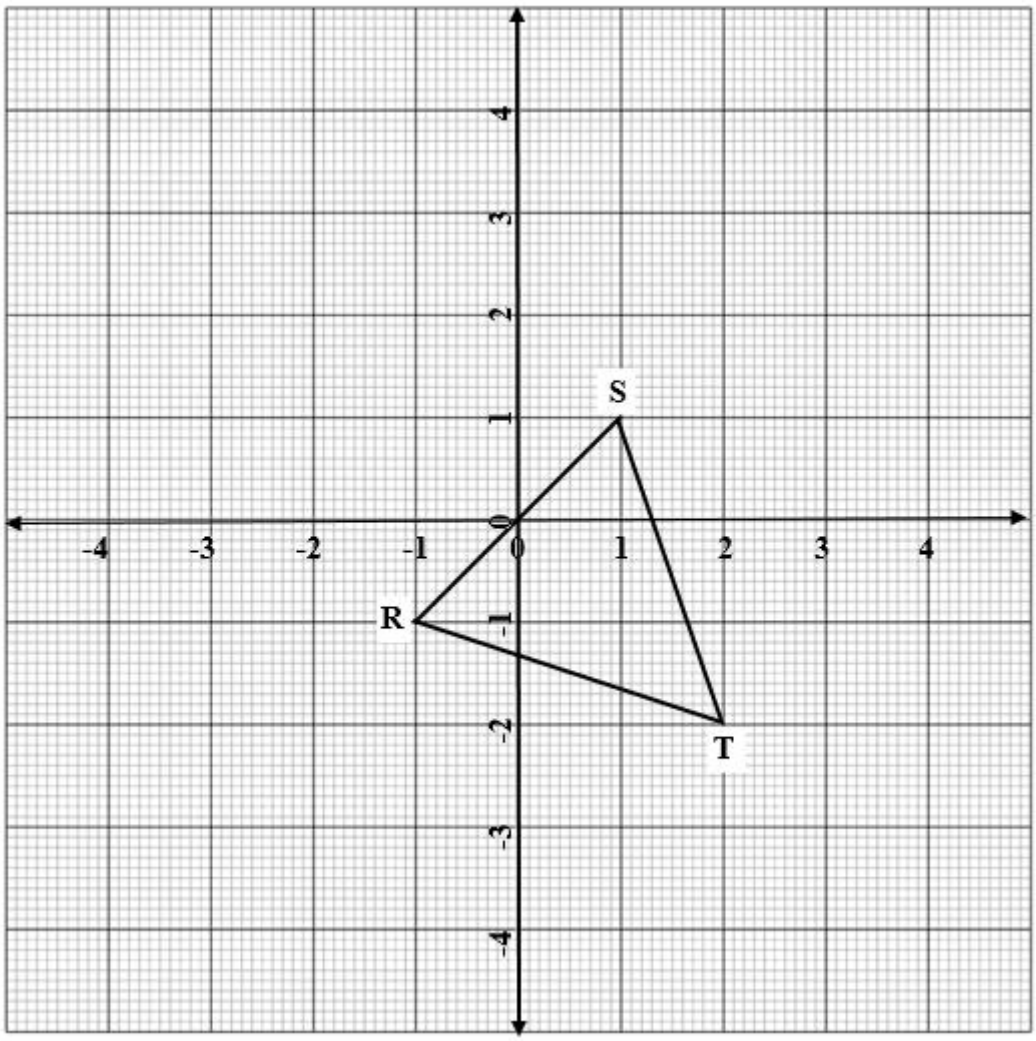

Figure 1

Draw its image when enlarged by scale factor 2, centre $(1,-1)$. **(4 marks)**

Continued/…

c) Figure 2. Shows line PQ which was rotated to $P'Q'$.

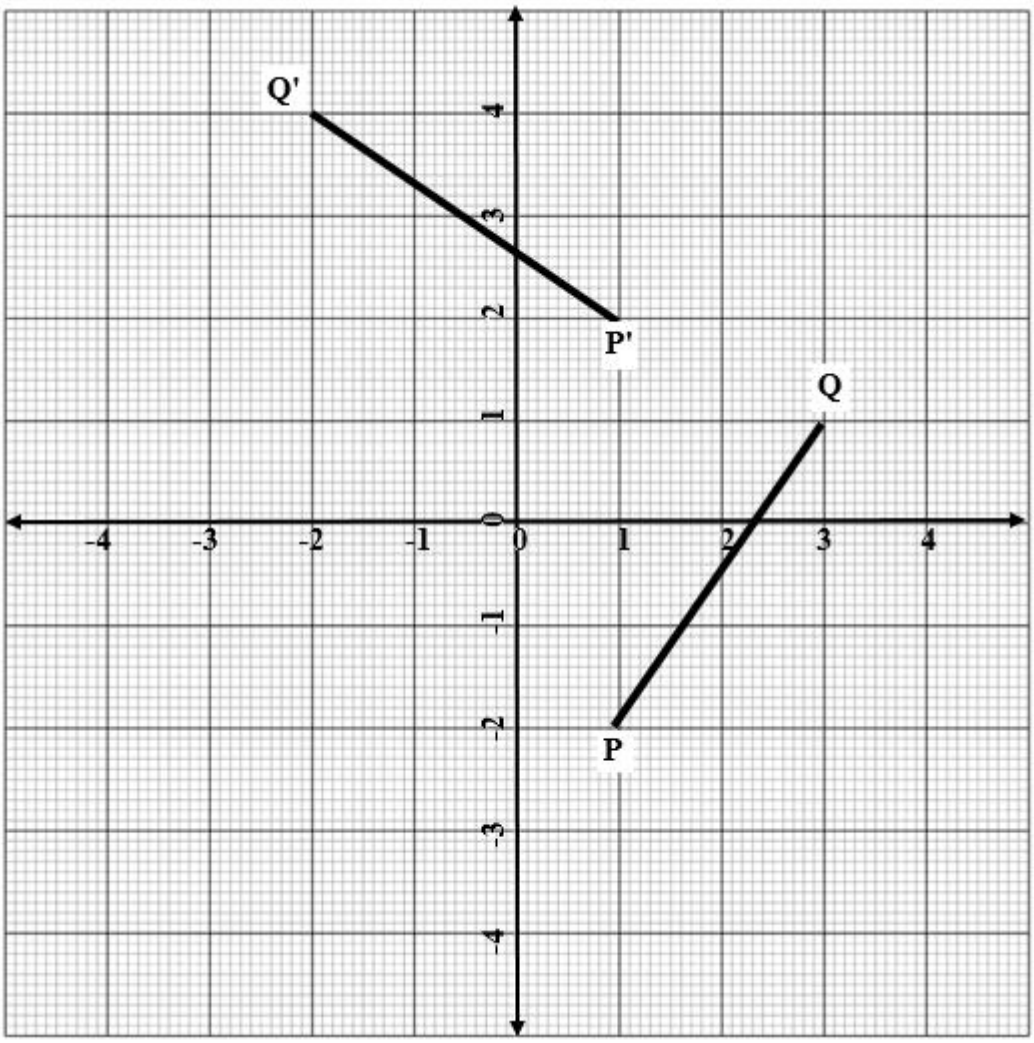

Figure 2

Find the centre and angle of rotation.

(3 marks)

2. a) Make n subject of the formula

$$\frac{\sqrt[p]{an^p - 3m}}{t} = n.$$

(7 marks)

b) The volume of a cone of radius r and height h is given as $v = {}^{1}/_{3}\,\pi r^2 h$. Express the radius in terms of the volume and the height.

(3 marks)

Continued/…

3. a) Express $2Log_2 3 - 1 + Log_2 6$ as a single logarithm.

(5 marks)

b) Solve the equation

$$\frac{32}{4^t} + 4^t = 18$$

(5 marks)

Continued/…

4. a) How many terms of the sequence $-12, -8, -4, ...$ must be added to give 36?

(6 marks)

a) A mouse runs to-and-fro in an enclosed track. In each trip, the rat takes twice the previous period to complete the track. If the rat took 3 seconds to complete the track in the first trip, how long will it take to complete the track in the 9^{th} trip?

(4 marks)

Continued/…

5. a) Figure 3 is a velocity-time graph representing Ramsey's journey to school.

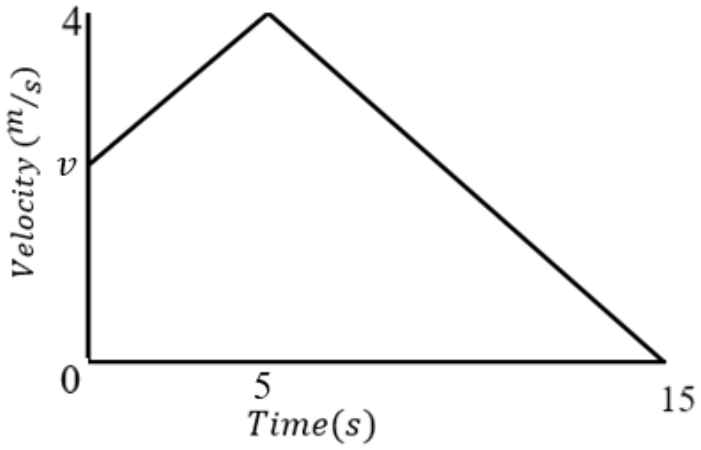

Figure 3

If the school is 75m away from his home, find the value of v.

(6 marks)

Continued/…

b) Figure 4 is a square-based pyramid of side 10m and slant edge 13m.

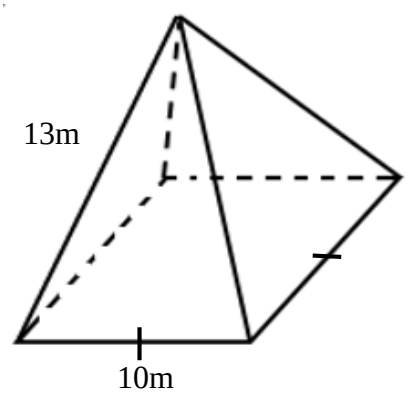

Figure 4

Find the volume of the pyramid.

(4 marks)

END OF QUESTION PAPER

NB: This paper contains 13 printed pages.