

NAME: _____ EXAMINATION NUMBER _____



M.A.J ONLINE LEARNING

2023-2024 MALAWI SCHOOL CERTIFICATE OF EDUCATION

MOCK 1 EXAMINATION

MATHEMATICS

Number; M121/II

Time Allowed 2H

Friday, 5 January 2023

8:00am –onwards

PAPER II

(100 marks) *for quality online lessons*

Join sir calculus, whatsapp / call 0996191946

Instructions

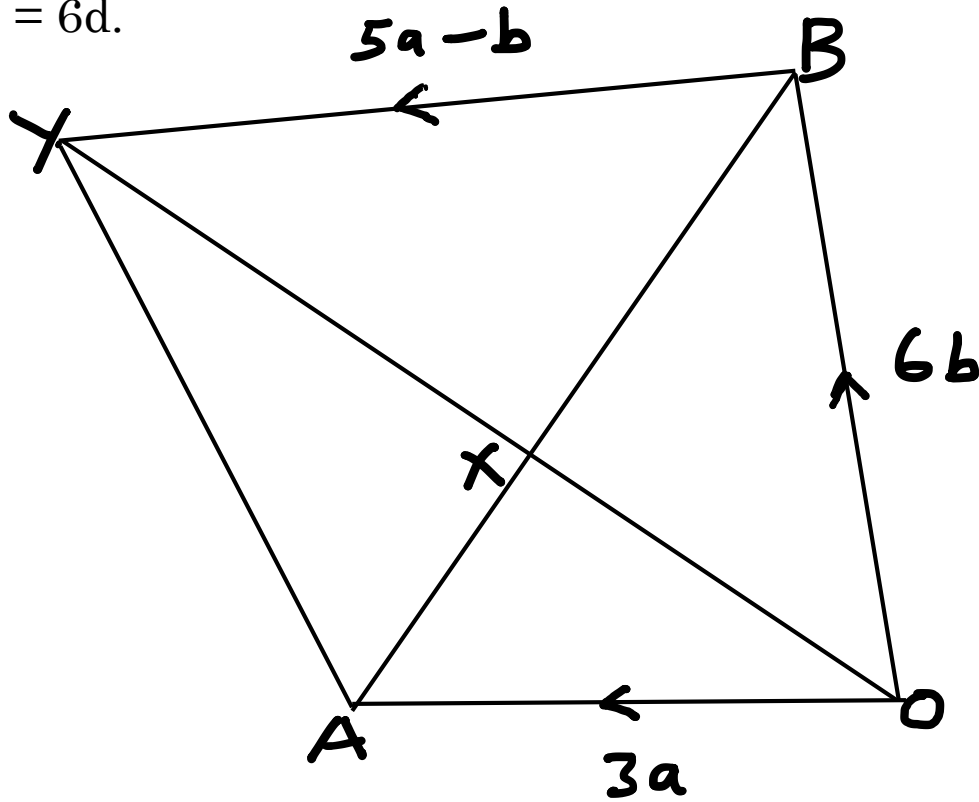
1. This paper contains 11 printed pages please check.
2. Before beginning fill your NAME at the top of each page.
3. Scientific calculator may be used
4. Answer All questions

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1. Solve the equation $x^3 - 6x^2 + 3x + 10 = 0$

[10 marks]

2. Figure 1, is a quadrilateral OAYB where $\overrightarrow{OA} = 3a$ and $\overrightarrow{OB} = 6b$.



- (a) Express \overrightarrow{AY} in terms of a and b

[5 marks]

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- (b) X is the point on AB such that $AX : XB = 1:2$ and $\overrightarrow{BY} = 5a - b$.
Prove that $\overrightarrow{OX} = \frac{2}{5}\overrightarrow{OY}$

[5marks]

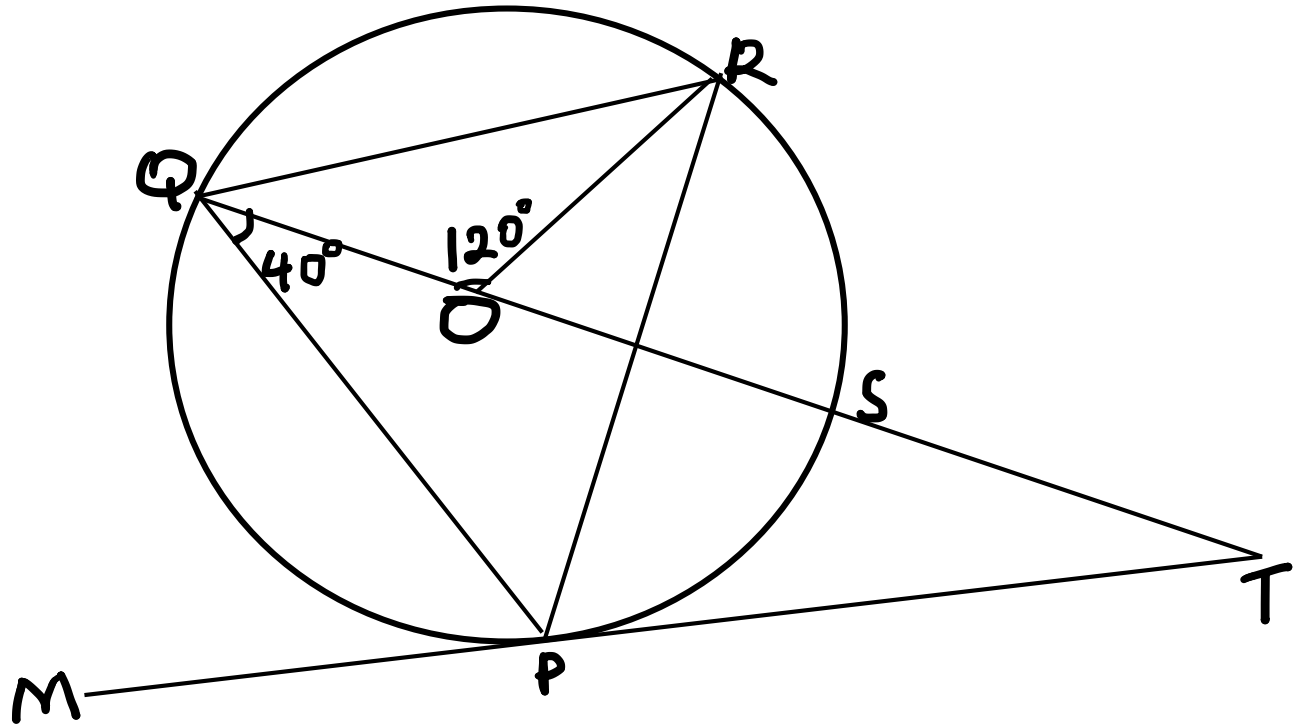
3. Solve the simultaneous equation

$$y = x^2 + 3x + 7$$

$$y - x = 10$$

[10 marks]

4. In the figure below PQR and S are points on the circumference of a circle centre O. the points T,S,O and Q lie on straight line MPT is a tangent to the circle at P.



- Find (a) $\angle SRP$
(b) $\angle ORP$

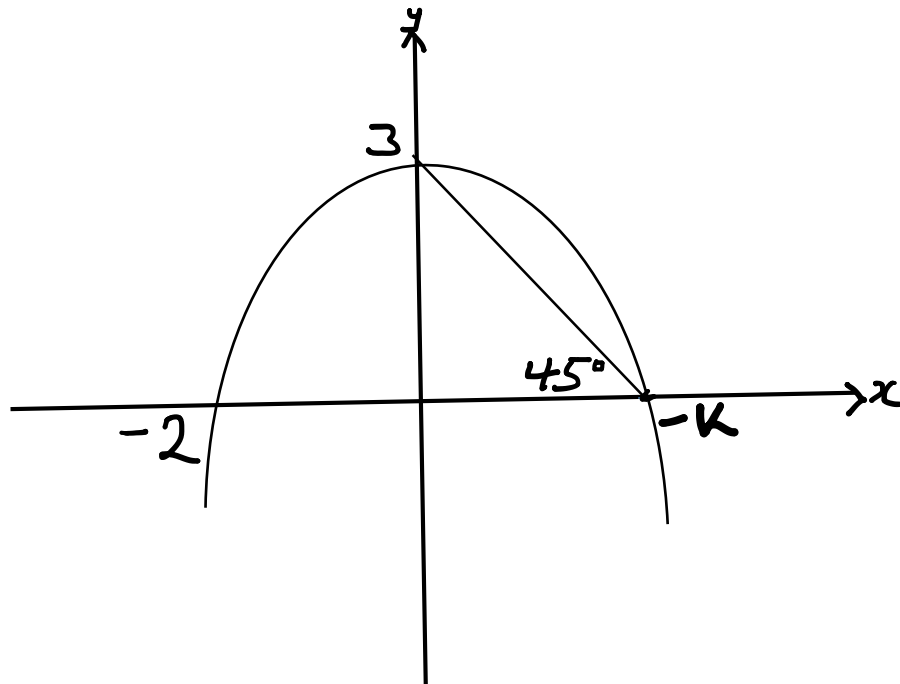
[10 marks]

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5. The first three terms of a GP are the first, fourth and tenth terms of an AP .Given that the first term is six, and all the terms of GP are different, find the common ratio.

[10 marks]

6. Figure 3, is quadratic graph, use it to answer the following questions



- (a) Find the value of k
- (b) Formulate equation of curve in form of $ax^2+bx+c=0$

[10 marks]

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7. Solve the equation $8^{2x} - 5(8^x) + 6 = 0$

[10 marks]

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8. A ship sails on a bearing of 074° for 10km followed by a bearing of 131° for 15k .work out the bearing of the ship from its starting position to the nearest degree.

[10 marks]

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9. Given that $A = \begin{pmatrix} 3 & 1 \\ 2 & 0 \end{pmatrix}$, $X = \begin{pmatrix} 5 & 1 \\ 4 & 1 \end{pmatrix}$ and $Z = \begin{pmatrix} 2 & 0 \\ 3 & 3 \end{pmatrix}$.

Find $A(X-Z)^2 + X$

[10 marks]

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10. Prove that angle between the tangent and the chord at the point of contact is equal to the angle in an alternate segment.

[10 marks]

Nkhalani ozitsata kuti ziphweke!!!!!!

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Turn over