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CENTRAL EAST EDUCATION DIVISION
2024 MALAWI SCHOOL CERTIFICATE MOCK EXAMINATION



MATHEMATICS

Tuesday, 19 March

Subject Number: M131/I
Time Allowed: 2 hours
08:00 – 10:00 am

PAPER I
(100 marks)

Instructions

1. This paper contains 14 pages. Please Check.
2. Answer all the 20 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 the question paper.
5. Scientific calculators may be used.
6. All working must be clearly shown.
7. Write your name on top of each page of this paper

Question Number	Tick questions answered	Do not write in these columns	
1			
2			
3			
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on

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1. Factorise completely $m^2 + 2mn + n^2 - p^2$ **(4 marks)**

2. Without using a calculator or four figure tables, simplify $\frac{1}{\sqrt{8}} - \frac{1}{\sqrt{18}}$, giving the answer with a rational denominator **(5 marks)**

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3. The sum of n th term of an arithmetic progression $S_n = 2n^2 + 9n$ find the first 3 terms of an A.P. **(5 marks)**

4. Make **P** the subject of the formula $M = \frac{VP^2}{C - P^2}$ **(5 marks)**

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5. **Figure 1** shows arrow diagram for the function $f(x) = 5x + 4$

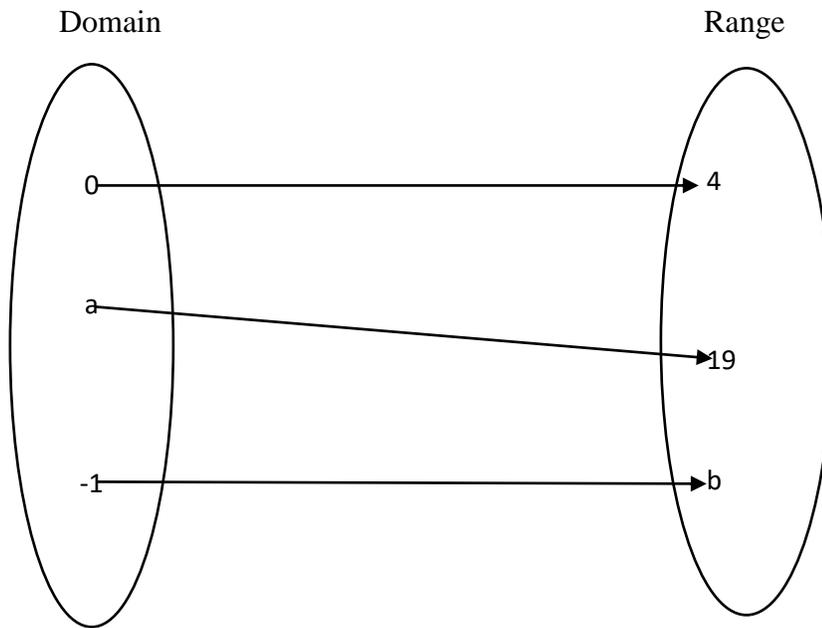


Figure 1

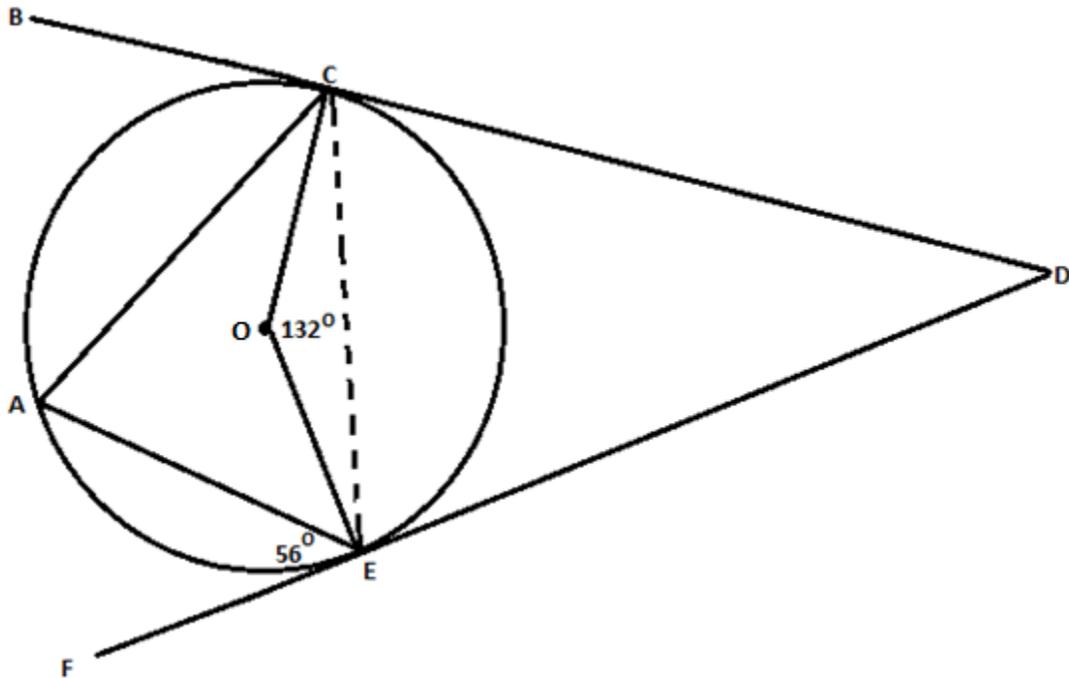
Calculate the values of **a** and **b**

(4 marks)

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6. Given the vertices of triangle **ABC** as A (2, 3) B (-3, 1) and C (2, -1). At which vertex is the triangle 90° ? (5 marks)

7. **Figure 2** **O** is the centre of the circle. **A**, **C** and **E** are all points on the circumference. **BCD** is a tangent touching the circle at point **C**. **DEF** is a tangent touching the circle at point **E**. Angle $\text{COE} = 132^\circ$ and angle $\text{AEF} = 56^\circ$. Calculate angle ACO . (5 marks)



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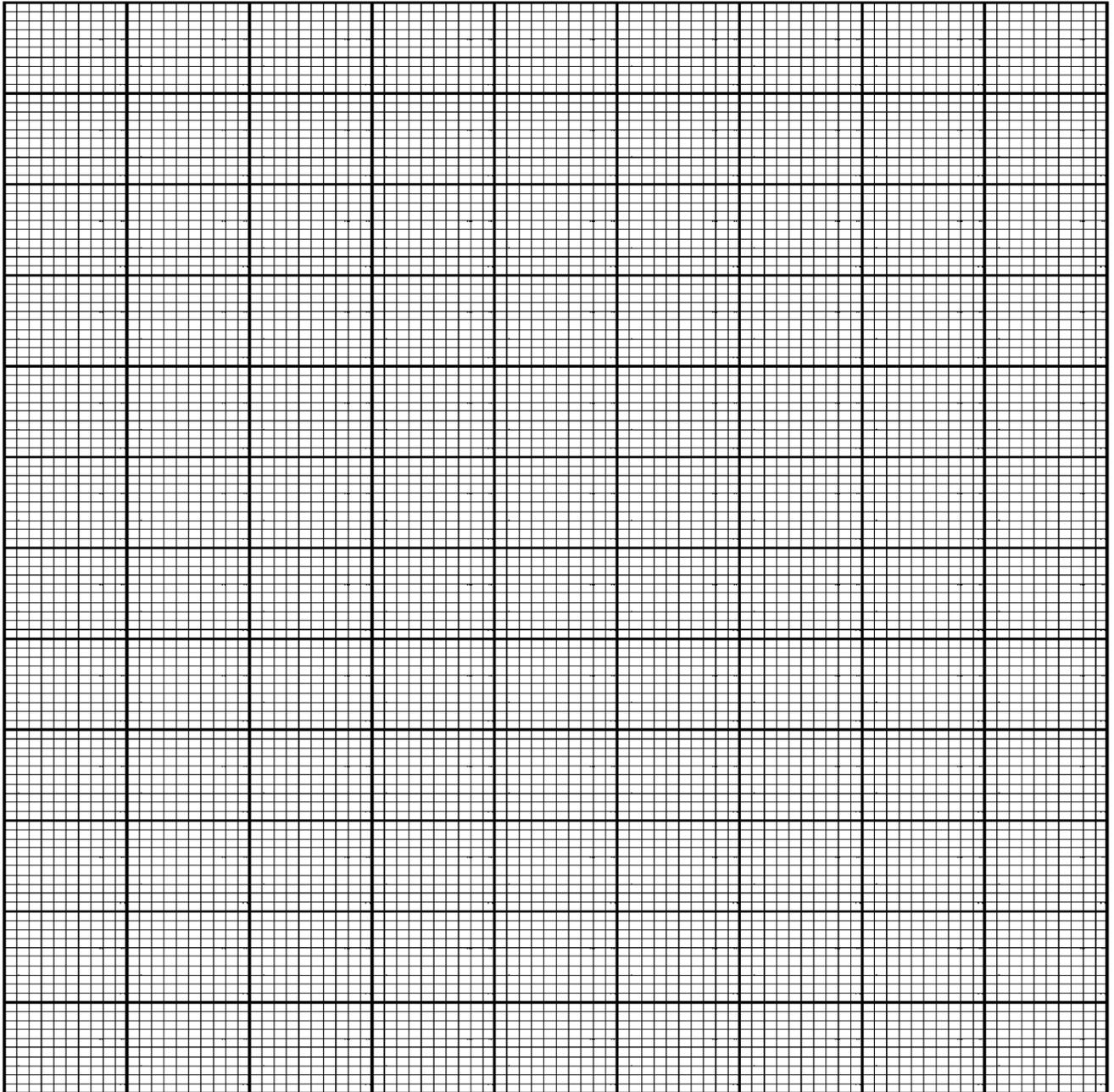
8. Given that $(x - 5)(x - 3)^2 \equiv Px^3 + Qx^2 + Rx + K$, find the value of **Q** **(4 marks)**

9. Shyreen Ireen and are identical twins except that Ireen is 1.2 times as tall as her sister. Shyreen spent K15, 000 on a cloth to make a national wear dress. How much would Ireen need to spend on cloth for a similar national wear dress? **(5 marks)**

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10. Triangle **ABC** has vertices **A** (1, 2), **B** (-2, 3) and **C** (-2, 4). Draw the triangle and its image **A'B'C'** on the graph paper under translation vector of 5 units down and 3 units to the right
(5 marks)

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11. Without plotting the graph of $y = x^2 - 4x + 3$ Find the coordinates of the turning point of the graph.

(5 marks)

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12. Given that matrix $M = \begin{pmatrix} 3 & 3 \\ -1 & -1 \end{pmatrix}$ and $M^2 = aM$ where a is a constant, calculate the value of a .

(5 marks)

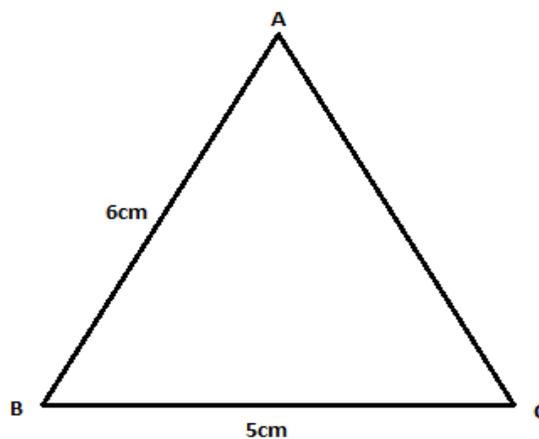
13. Solve the equation $2x^2 - 8x - 7 = 0$, giving the answer correct to 2 decimal places

(5 marks)

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14. Without using a calculator, evaluate $\frac{\sin 60^\circ \tan 45^\circ}{\tan 30^\circ \cos 30^\circ}$ (4 marks)

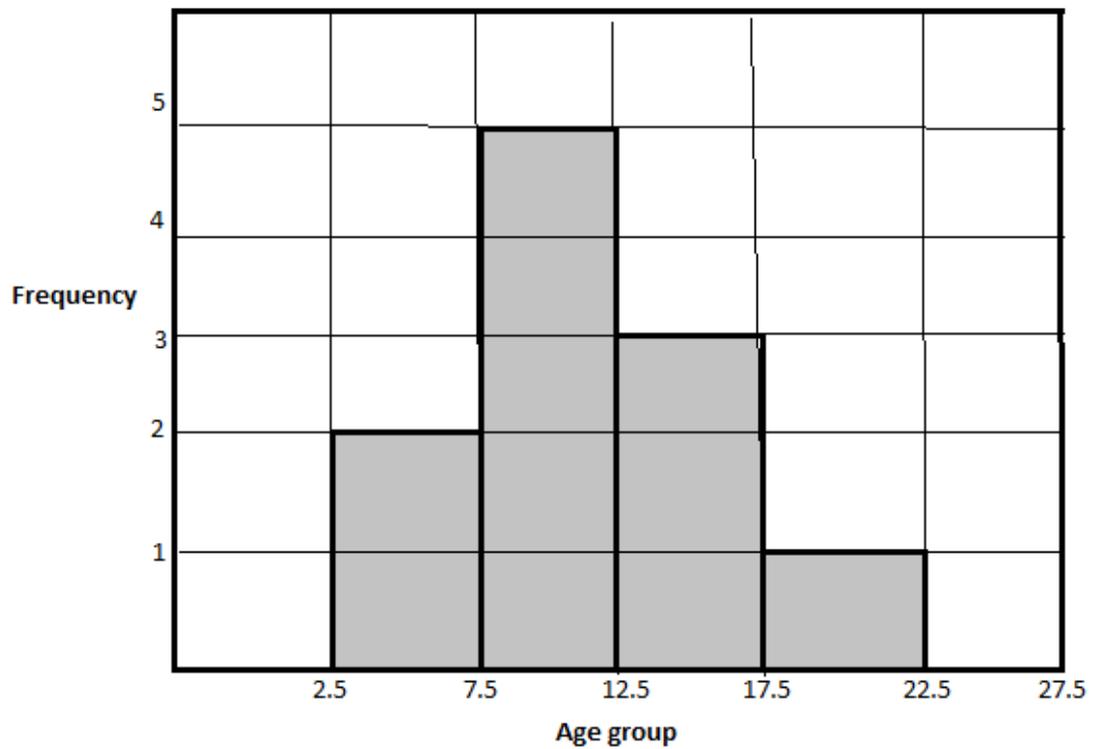
15. Figure 5 shows a triangle **ABC** in which $AB = 6\text{cm}$ and $BC = 5\text{cm}$



- i. Given that the area of triangle **ABC** = 12 cm^2 , find the value of angle **ABC** giving your answer correct to the nearest degree. (5 marks)

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16. **Figure 6** is a histogram representing the age group of students who uses a school bus for Hope private secondary school.



- i. Construct a frequency distribution table from the histogram provided.

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- ii. Use your frequency distribution table to find the capacity of the school bus. **(7 marks)**

17. The mass (M) of a cylindrical tin varies directly as its height (h) and inversely as the square of its radius (r). If the tin 50cm high and of radius 2cm has a mass of 500g, find the mass of a cylindrical tin of 10cm high and of radius 4cm. **(6 marks)**

18. The radius of cylindrical water tank containing 2800 litres is 1.4m. A tap is left running and water level in the tank drops by 40cm. How much water is left in the tank? (take $\pi = \frac{22}{7}$)

(6 marks)

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19. A chord of a circle center O is 8cm long. If the distance from the center to the chord is 3cm long, sketch the diagram and calculate the radius of the circle. **(6 marks)**

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20. Sketch the region described by the following inequalities by shading the unwanted region.

i. $y \leq 3$

ii. $2x + y \leq 6$

iii. $Y > x$

(4 marks)

END OF QUESTION PAPER

NB: This paper contains 13 pages.