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CENTRAL EAST EDUCATION DIVISION
2024 MALAWI SCHOOL CERTIFICATE MOCK EXAMINATIONS



MATHEMATICS

Wednesday, 20 March

Subject Number: M131/II

Time Allowed 2 hours 30 mins
08:00 – 10:30 am

PAPER II
(100 marks)

Instructions

1. This paper contains 14 pages. Please check.
2. Answer all the **six** questions in section A and any **four** in section B.
3. The maximum number of marks for each answer is indicate against each question.
4. Write your answers in the spaces provided on 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 if answered	Do not write in these columns	
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
Total			

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Turn over



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SECTION A

(60 marks)

Answer **all** the **six** questions in this section A

1a. Simplify $\frac{m^2 + mn}{mn - n^2} - \frac{m^2 + 2mn + n^2}{m^2 - n^2}$ (5 marks)

b. Simplify $\frac{\sqrt{6}}{\sqrt{147 - \sqrt{147}}}$ Leaving your answer with rational denominator. (4 marks)

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2a. Solve the equation $\log_4 32^{2a} = 2a - 1$

(5 marks)

b. Given set of points A, B and C such that A (-3, 3), B (1, 1) and C (3, 0), show that points A, B and C are collinear.

(4 marks)

3. a. Prove that the angle which the chord makes with the tangent is equal to the angle



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 subtended by the chord in the alternate segment. (6 marks)

b. Figure 1 shows a circle PQR with tangent SR at R and QP is parallel to SR

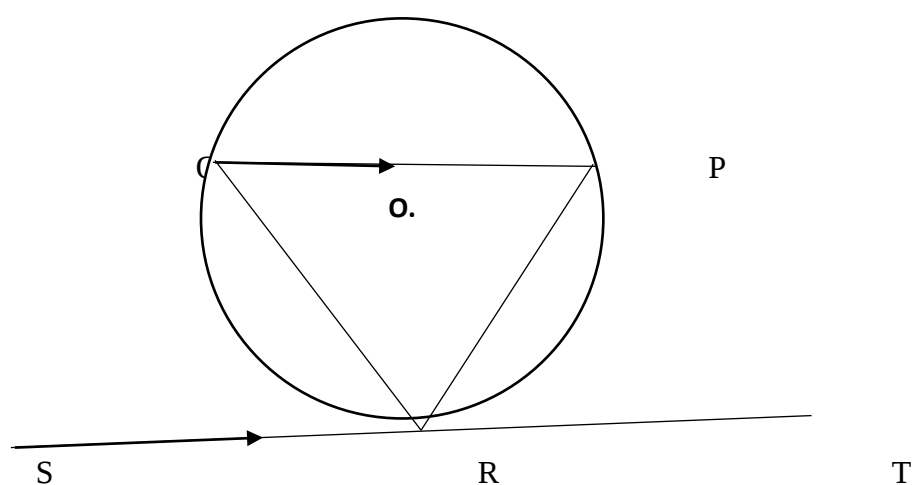


Figure 1

Show that $PR = QR$ (4 marks)

4. a. If $n(P \cap Q) = 48$, $n(P \cap Q') = 5x$, $n(P' \cap Q) = 4x$ and $n(P \cap Q) = 3x$ find the value of x . (4 marks)

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- b. Memory bought 2 mangoes and 3 apples while Maclean bought 4 mangoes and 5 apples, mangoes cost K120 each and apples cost K180 each **(5 marks)**
- (i). Present this information in two matrices.

(ii). Using matrix multiplication find the amount of money spent by each

5. a. Using a ruler and a pair of compasses only, construct in the same diagram. **(6 marks)**
- (i). A circle central O of diameter 7 cm.
- (ii). Two tangents to a circle at A and B from an external point T which is 9 cm away from the centre O



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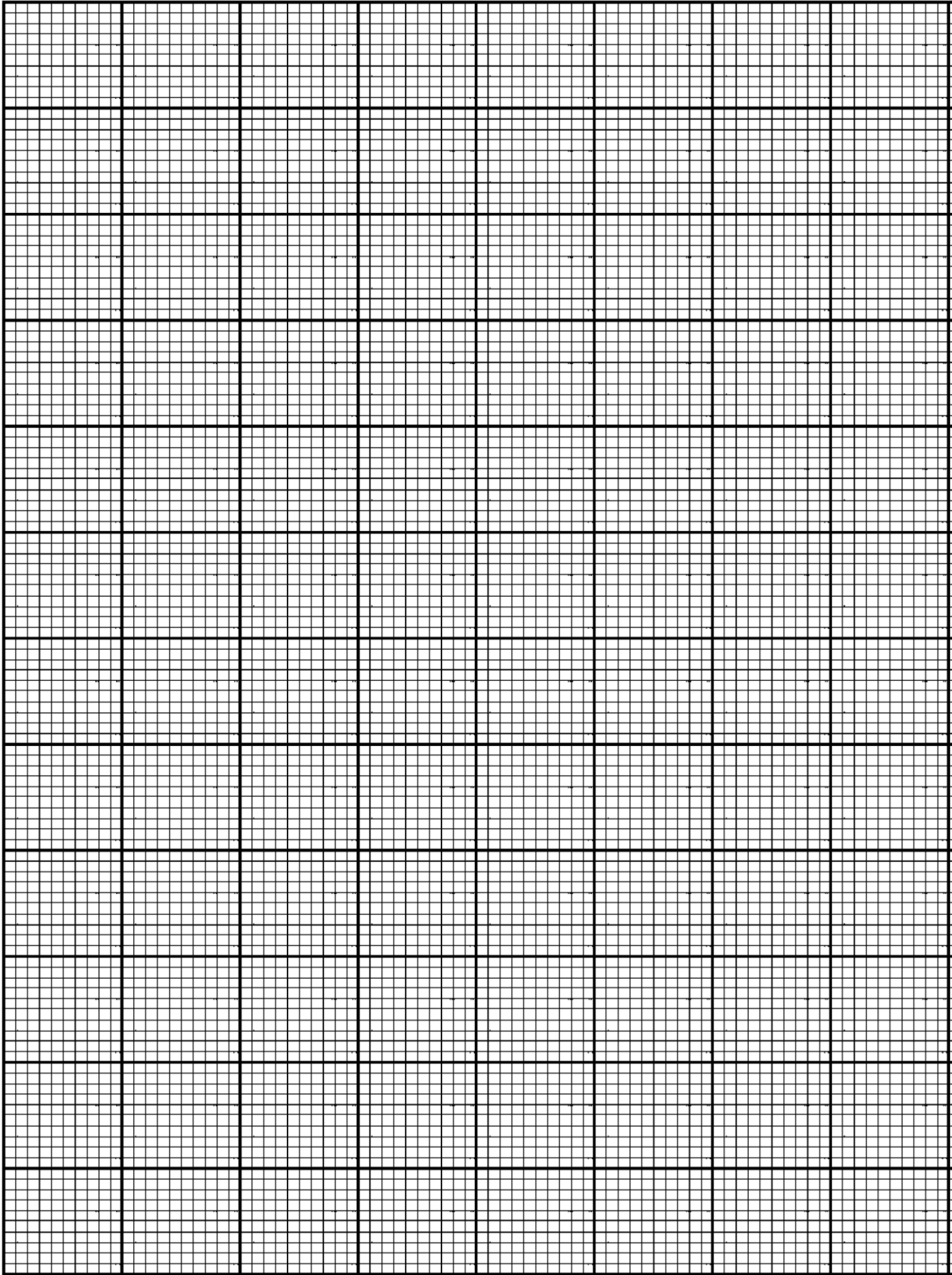
(iii). Measure and state the value of angle **ATB**

b. Use the graph on page provided to draw triangle **RST** with vertices **R** (2, 2) **S** (4,4) and **T** (4, 1) on the same plane Draw triangle **R'S'T** with vertices **R'** (- 1, 5) **S'** (7 ,13) and **T'** (7.1) use the scale of 2 cm to represent 2 units on both axes

(i). Find the coordinates of the centre of enlargement **(7 marks)**



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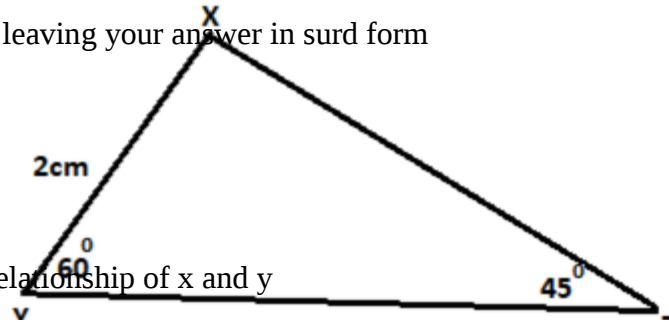


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6a. Figure 2 shows a triangle XYZ such that angle $XYZ = 60^\circ$, angle $YZX = 45^\circ$ and $XY = 2\text{cm}$

Calculate the length of XZ leaving your answer in surd form

(5 marks)



6.b. Figure 3 is sketch of relationship of x and y

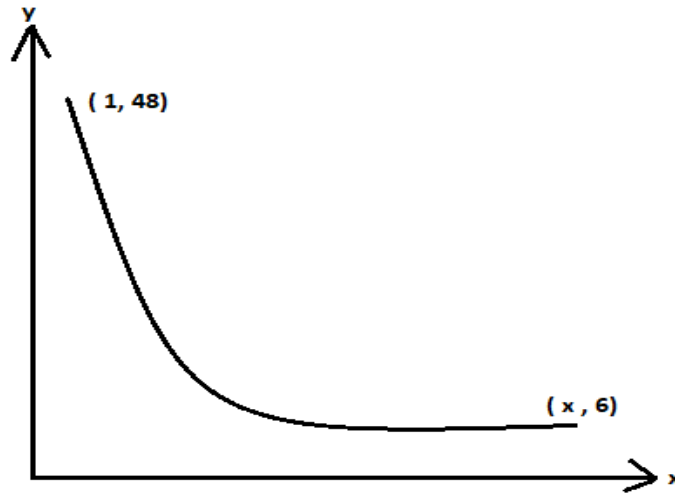


Figure 3

Calculate the value of x

(5 marks)

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SECTION B (40 marks)

Answer any **four** questions from this section

- 7) a. In a car park, there were 20 cars. Yankho noticed that 10 of the cars were red in colour and 7 cars had sunroofs. Only 3 red cars had sunroofs.

i. Show this information in a Venn diagram.

|

- ii. Calculate the probability that a car chosen at random had no sunroof
(6 marks)

- b. Find the standard deviation for the set of data whose deviations from the mean are -2, -3, 4, 1
(4 marks)



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8. In a concert hall first row has 10 seats in it and each subsequent row has 5 more seats than the row in front of it. If the last row has 85 seats.

a) How many rows are there in a hall? **(6 marks)**

(b) If the seats were borrowed at k150 per chair how much did the protocol committee pay for the seats? **(4 marks)**

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9. When Y is expressed in terms of X, it consists of the sum of two terms. The first term is directly proportion to X and the second is inversely proportional to X. If $Y = 11$ then $X = 1$ and $Y = 10$ when $X = \frac{1}{2}$. Find:

i. The precise expression for Y in terms of X. **(6 marks)**

ii. Use the expression in 10, to find :

a) The value of Y when $X = 3$ **(2 marks)**

b). The value of X when $Y = 14$ **(2 marks)**

10. A shadow of a flag pole is 10m higher when the altitude of the sun is 30° than it is when the altitude is 60° . Find the height of the flag pole leaving your answer in surd form where possible.

(10 marks)

11. Solve the equation $2x^3 + x^2 - 13x + 6 = 0$

(10marks)



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12. The worker finds that the earnings per week depends on the time spend in the shop and in the office if x hours per day are spend in the shop the weekly earning y Kwacha are given by the relation $Y=11+24x-3x^2$
- i. Complete the following table of values for $y = 11+24x-3x^2$ **(2 marks)**



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x	0	1	2	3	4	5	6	7	8
y	11	32	47	56			47	32	11

- ii. Using a scale of 2cm to represent 10 units on vertical axis and 2cm to represent 1 unit on horizontal axis, draw the graph of $y = 11 + 24x - 3x^2$ on the graph provided.



A full-page sheet of white graph paper featuring a uniform black grid. The grid consists of small squares, with thicker lines forming a larger square frame around the perimeter. There are no margins, text, or other markings on the page.