Name: _____

MATINDI COMMUNITY DAY SECONDARY SCHOOL

2021 MALAWISCHOOL CERTIFICATE OF EDUCATION MOCK EXAMINATION

MATHEMATICS

Subject Number: M0131/II

Thursday, September 2021 **Time allowed: 2hours**

07:30 am-09:30am

PAPER II

(100 marks)

Instructions

This paper contains **9 pages**. Please check.

1. Attempt all questions in this paper
2. The maximum number of marks for each answer is indicated against each question.
3. Write your name at the top of each page of your question paper in the spaces provided.
4. Write your answers in the spaces provided on this paper
5. In the table provided on this page, tick against the question number you have answered.
6. All working must be clearly shown

1.

a. Simplify $\frac{3y+6}{y^2-y-6} - \frac{12}{y^2-2y-3}$

(5 marks)

b. Two circles have a scale factor of 3. Find the radius of the bigger square if the smaller circle has an area of$36cm^2$.

(4 marks)

Name: _____

2.

a. Given that log 2 = 0.301 and log 3 = 0.4771. Without using tables find the value of log 60.

(4 marks)

b. A vertical post cost a shadow of length 15cm when the angle of elevation of the sum is 55°. Find the height of the post.

(5 marks)

3.

a. Given that M and N are position vectors such N = $\begin{pmatrix}1\\3\end{pmatrix}$ and MN$\begin{pmatrix}-2\\4\end{pmatrix}$. Find the position of vector M.

(5 marks)

b. Solve the equation $2^{2x} - 5(2^x) + 4 = 0$

Name: _____

(7marks)

4.

a. Given that the universal set M ={1,2,3,4,5,6,7,8,9}

Subject of A = $\{even\ numbers\}$

B= $\{perfect\ squares\}$

Find $\cap\ (A \cup B)$

(5 marks)

b. Using a ruler and a pair of a compass only, construct a circle centre O of diameter 5.5cm. Through a point x on the circle, construct a tangent TX such that TX is 6.2cm. Measure and state the length of TO.

(5 marks)

5.

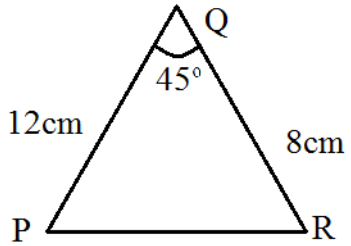
a. Make R the subject of formula

A = P $(I + \frac{R}{100})^T$

Name: _____

(5 marks)

b. Figure below the area of triangle PQR in which PQ = 12 cm, QR = 8cm and angle PQR =45°.



Work out area of triangle PQR leaving your answer in simplified suds.

(5 marks)

6.

a. Factorise completely $2x^3 + 5x^2 + 4x - 3$.

(5 marks)

b. Solve the simultaneous equation.

$y = 2x^2 - 13x + 15$

$y = -x + 2$

Name: _____

(5 marks)

SECTION B

Answer any four questions from this section.

7.

a. The polynomial $ax^3 - bx^2 + 6$ has a factor of $x + 2$ and when it is divided by $x + 1$ the remainder is 10. Find the value of the constants a and b.

(5 marks)

b. Given that tan x = $\frac{5}{12}$ evaluate $\frac{Cos\ x - \sin x}{\cos x + \sin x}$

(5 marks)

8.

a. The sum of the first terms of geometric progression GP is $2^{n+1} - 1$. Calculate

i. The first term of the GP

ii. The common ratio of the GP

(5 marks)

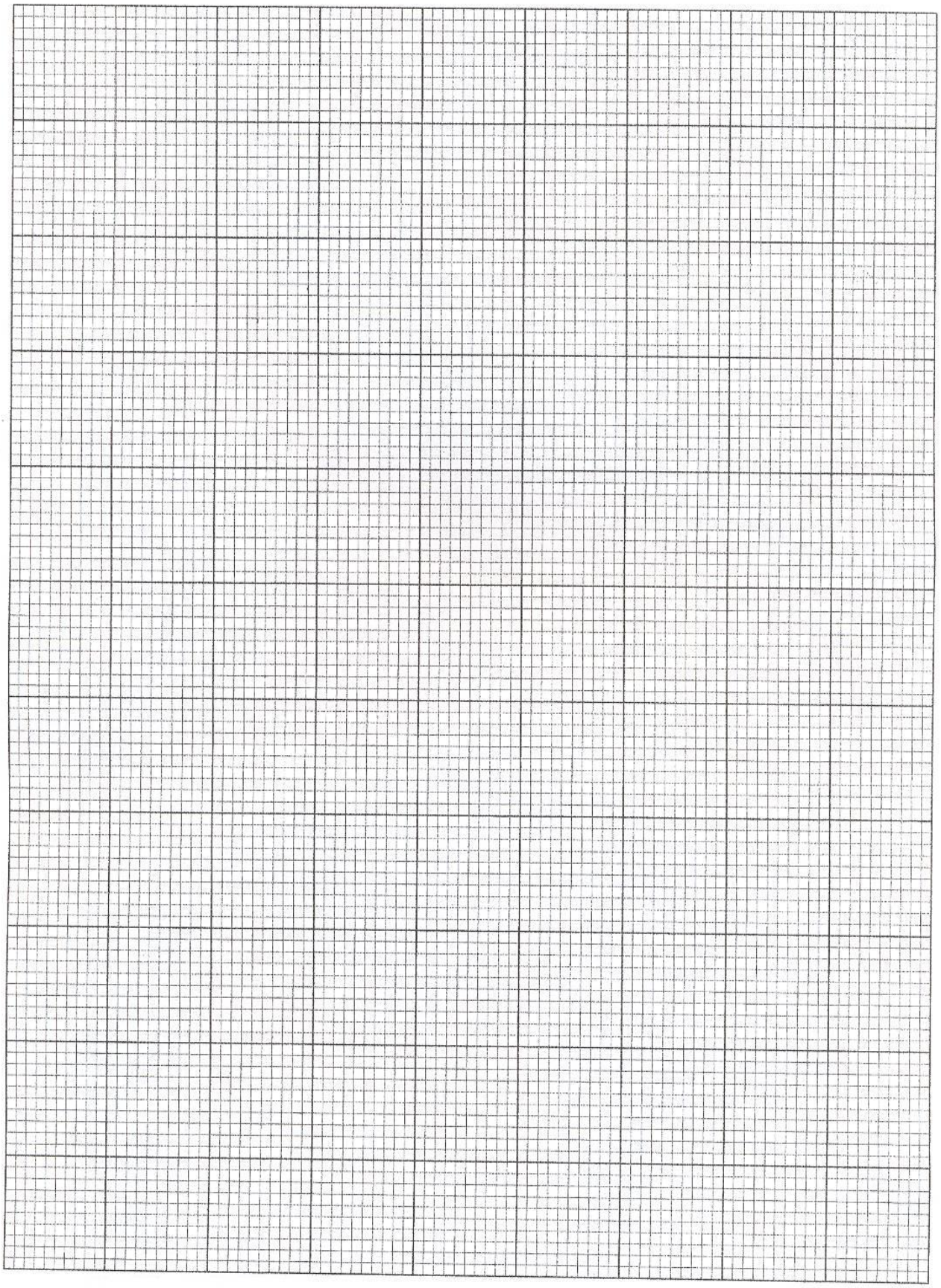
b. Copy and complete the table of values for the equation $y = x^2 - 3x + 10$

X	-1	0	1	2	3	4	5
Y	14		8	8	10		20

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

Name: _____

ii. $y = x + 7$ **(8 marks)**



Name: _____

9.

a. Evans left from A and drove on bearing of 051° to town B. He them drove 70km on a bearing of 115° to town C which is on a bearing of 110° from town A. Calculate the distance between town A and C, giving your answer correct to two decimal places.

(5 marks)

b. A team has 60% chance of winning a game when it plays the first game at home. When it wins at home and 35% chance of winning when it loses at home.

i. Draw a probability of tree diagram.

ii. Using the probably tree diagram, calculate the chance that the team Wins at home and loses an away game.

(5 marks)

10.

a. Using a scale 2cm to request 1 unit both axes.

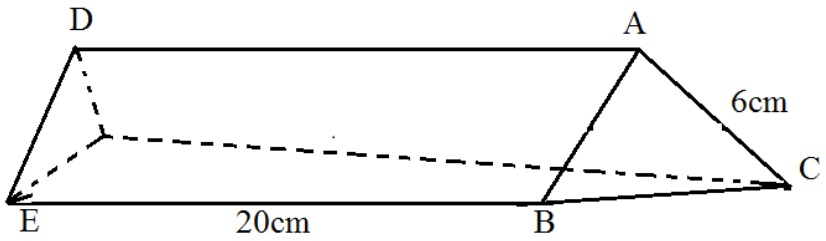
i. Draw triangle K(5,1), L(5, - 2) β M (2 – 3)

ii. On the same axis draw the image of triangle KLM under a translation.

Name: _____

(5 marks)

b. Figure 2 below shows a wooden prism with triangular cross section ABC. BE = 20mc, AB = B C= AC = 6cm ACFD, BCFE, and ADEB are rectangles.



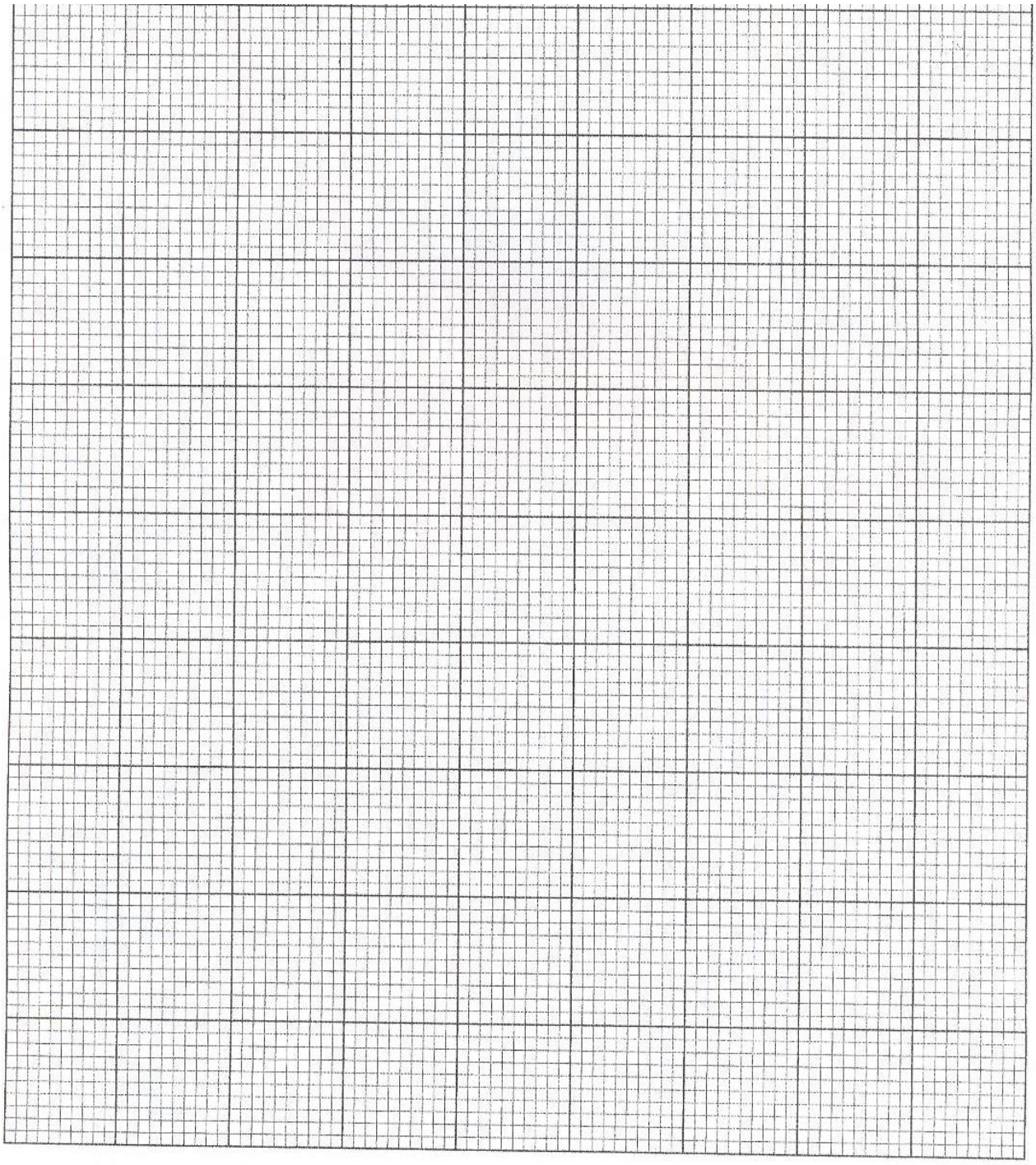
Calculate angle DCE.

(5 marks)

11. Mr. Tembo employs a person to clean a house and to wash clothes. The person works almost 40 hours in a week. He spends at least 16 hours cleaning the house and at least 6 hours washing clothes in a week. He also spends less than half the five spend in cleaning the house to wash clothes.
    i. Taking x to represent number of hours for cleaning the house and y to represent the number of hour for washing clothes, write down four inequalities in x and y that satisfy the above information.

Name: _____

ii. Using a scale of 2cm to represent 5 units on both axes, draw graphs to show the region bounded the inequalities, shade the unwanted region.



Name: _____

iii. Use the graphs to find the maximum number of hours the person can spend in cleaning the house.

(10 marks)

12. The parking fee (p) for an airplane at an airport is partly constant and partly varies with time (T) that it wants at the airport. A one-hour fee is K200,000.00 and two hour fee is K375000.00. calculate the time taken for an airplane which has been charged a fee of K112500.00

(10 marks)

THE END OF QUESTION PAPER