



NORTHERN EDUCATION DIVISION

JUNIOR CERTIFICATE OF EDUCATION

MOCK EXAMINATION

MATHEMATICS

(100 marks)

DATE: Tuesday, 8 April, 2025

Subject Number: J131

Time Allowed: 2hours

Instructions

1. This paper contains **13 pages**. Please check.
2. Attempt all the twenty questions in this paper
3. The maximum number of marks for each answer is indicated against each question.
4. Write your examination number at the top of each page of your question paper in the spaces provided.
5. Write your answers in the spaces provided on this paper
6. In the table provided on this page, tick against the question number you have answered.

Question number	Tick if answered	Do not write in these columns	
1			
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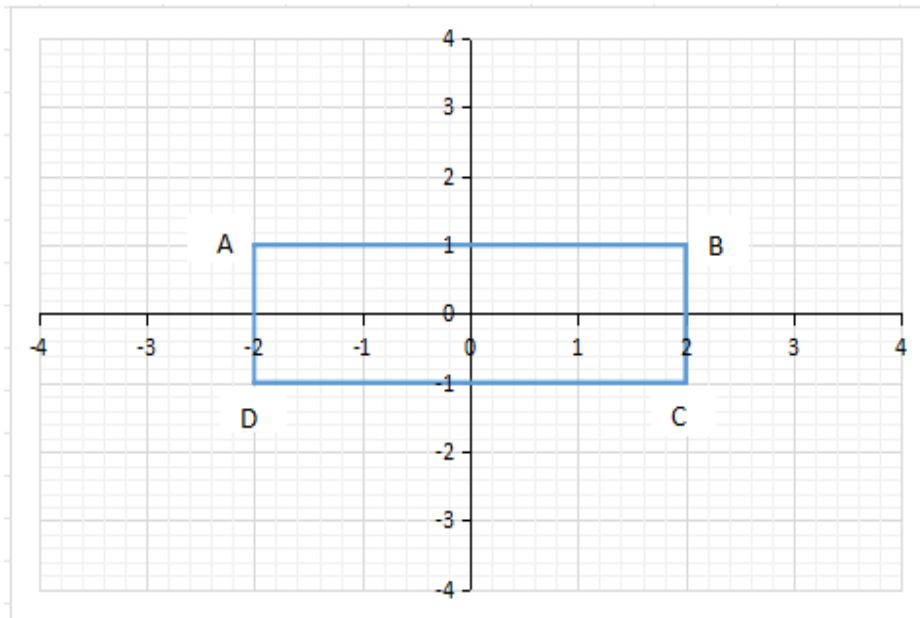
Student's Name :..... Class:

Answer all the twenty questions in the space provided under each question

1. a. Given that $w = -3$, $x = -1$, and $y = 2$, evaluate $\frac{y-w}{x^2}$ (3 marks)

b. Find the LCM of $4pq^2$, $2(pq)^3$ and $3p^2q$ (3marks)

2. a. Figure 1 shows rectangle ABCD on a cartesian plane.



If the rectangle ABCD is reflected on the line $y = 0$, draw image $A'B'C'D'$ on the same pair of axes. **(3 marks)**

b. **Figure 1** shows a right angled triangle ABC, in which $AB = x$ cm,
 $BC = \sqrt{x + 2}$, $AC = \sqrt{x + 3}$,

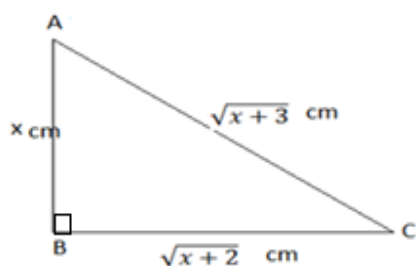


figure 1

Calculate the length of AB (4 marks)

3. a. Simplify $\frac{(x^2-9)10y}{2x-6}$ (3 marks)

b. Given that $\mu = \{1,2,3,4,5,6,7,8,9\}$, $A = \{1,2,3,4,5,6\}$,
 $B = \{\text{odd numbers}\}$, show the sets on the Venn diagram (3 marks)

4. a. Simplify $3453_6 - 555_6$, leaving your answer to base 6 **(4 marks)**

b. Make p the subject of the formula, $3t = \frac{pt^2}{q} + t$ **(4 marks)**

5. The sum of interior angles of a regular convex polygon is 900°
a. Find the number of sides of the polygon **(4 marks)**

b. Find the size of exterior angle in the polygon **(2 marks)**

6. Find the gradient of the line that passes through point A (2,-1) and B(-1,5)
(3 marks)

7. Faith is 3 years older than her sister fortunate, given that the product of their ages is 108 , how old is fortunate
(6 marks)

8. **Table 1**, shows the rate of income tax payable by employees at a company:

Table 1

Income per month	Rate of tax
First K200,000	0%
Next, K300,000	10%
Excess K400,000	40%

Calculate the income tax payable by an employee who earns a monthly salary of K1, 500,000. **(4 marks)**

9. **Figure 2**, is pie chart showing students involved in various sports

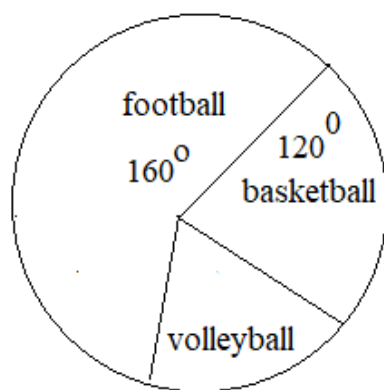


figure 2

If the total number of students involved in various sports is 72 students, how many students are involved in volleyball? **(3 marks)**

10. The area of the curved surface of a cylinder is 88m^2 , given that its radius is 1.4m, calculate the height of the cylinder (take $\pi = \frac{22}{7}$) **(3 marks)**

11. Mr. Phiri has 20 kg of high-quality beans, which he is selling at K2000 per kg. How many kilograms of low-quality beans selling at K1200 per kg does he need to mix in order to sell the mixed beans at K 1600 per kg (6 marks)

12. Use logarithms to evaluate $(3.024)^2 \times 1.005$ giving the answer correct to three significant figures. (4marks)

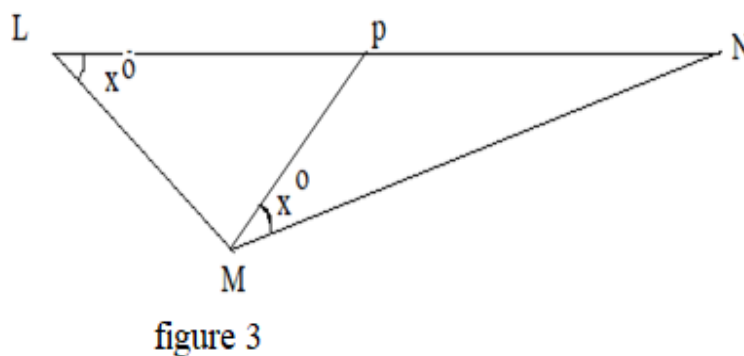
13. Find the product of 5th and 6th term of the sequence ;
56, 51, 46, 41.... (3 marks)

14. Using a ruler and pair of compasses only, construct triangle ABC, in which angle $ABC = 120^\circ$, $AB = 3\text{cm}$, $BC = 5\text{cm}$.
Measure and state the length of AC **(5 marks)**

15. A letter is selected at random from the word MATHEMATICS. What is the probability of picking a vowel from the word? **(4 marks)**

16. A book contains 248 pages. Annabel reads n complete pages every day. After 10 days, she is remaining with less than 18 pages. Formulate an inequality and solve for n . **(5 marks)**

17. **Figure 3**, shows triangle LMN, in which angle MLN = angle NMP = x°



Show that $\triangle NLM$ is similar to $\triangle NMP$ **(4 marks)**

18. **Figure 4**, is the distance time graph showing the motion of Lesley from her house to the market and back

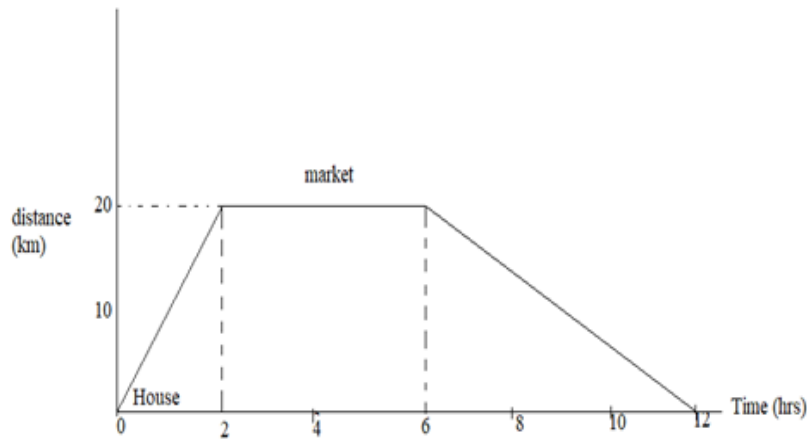


figure 4

a. For how long was Lesley at the market (2 marks)

b. Calculate her returning speed from the market to her house (3 marks)

19. The **table 2** and **table 3** shows the values of equations $2x - y = 3$ and $x + 2y = 4$

$$2x - y = 3$$

X	-1	0	1	2	3	4
Y	-5	-3	-1	1		5

Table2

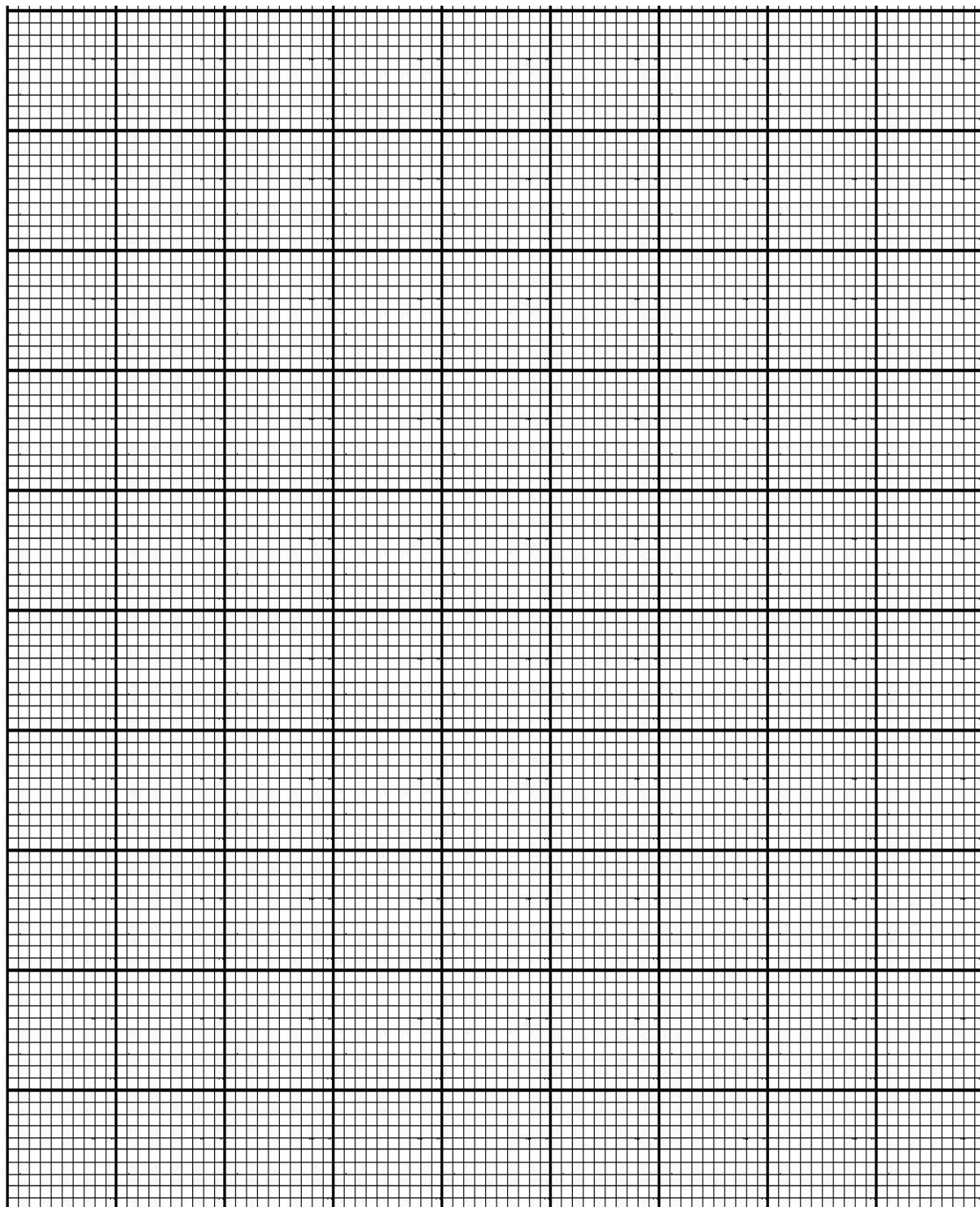
$$x + 2y = 4$$

X	-1	0	1	2	3	4
Y	2.5	2	1.5		0.5	0

Table 3

a. Calculate the missing values in **table 1** and **table 2** (2 marks)

b. Using the scale of 2cm to represent 1 unit on both axes plot the graph of :
 $2x - y = 3$ and $x + 2y = 4$ (4 marks)



c. Use the graph plotted to solve the simultaneous equations

$$2x - y = 3$$

$$x + 2y = 4$$

(2marks)

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20. The diagonals of a rhombus are 10cm and 24cm long. Calculate the length of the sides of the Rhombus **(4marks)**

END OF QUESTION PAPER

