NAME _____**SCHOOL**_____

2025 **M131/II**

SOUTH WEST EDUCATION DIVISION

2025 MALAWI SCHOOL CERTIFICATE OF EDUCATION MOCK EXAMINATIONS

MATHEMATICS

Subject Number: M131/II

Friday, 28 March

Time allowed: 2 ½ hours

(08:00-10:30 am)

PAPER II

(100 marks)

Instructions

1. **This paper contains 18 printed 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 indicated 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 shown clearly**.
7. Write your **name** and the **name of your school** at the top of each page of your question paper in the spaces provided.
8. In the table provided on this page, **tick** against the question number you have answered.
9. At the end of the examination, hand in your paper to the invigilator.

Question number	Tick if answered	Do not write in these columns	
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Section A (60 marks)

Answer **all** questions in this section in the spaces provided.

1. a. Simplify $\frac{2a-4a^2}{a-2} \div \frac{a(1-2a)}{a^2-5a+6}$ **(5 marks)**

b. Given that the points $\boldsymbol{A}(1,9), \boldsymbol{B}(2,k)$, and $\boldsymbol{C}(5,17)$ are collinear, find the value of k.
(4 marks)

2. a. Given that the volume factor of two similar rectangular gardens is 27, find the area factor. **(4 marks)**

b. Factorise completely $x^3 + 2x^2 - 5x - 6$ **(6marks)**

Continued/…

3. a. Given that the probability of Jim scoring a penalty is 0.6. If he takes two penalties, calculate the probability that he scores at least once. **(5 marks)**

b. Without using a calculator simplify $\frac{2\sqrt{3}+4}{\sqrt{3}-1}$, leaving the answer with a rational denominator.

(4 marks)

Continued/…

4. a. Prove the theorem which states that the opposite angles of a cyclic quadrilateral are supplementary. **(5 marks)**

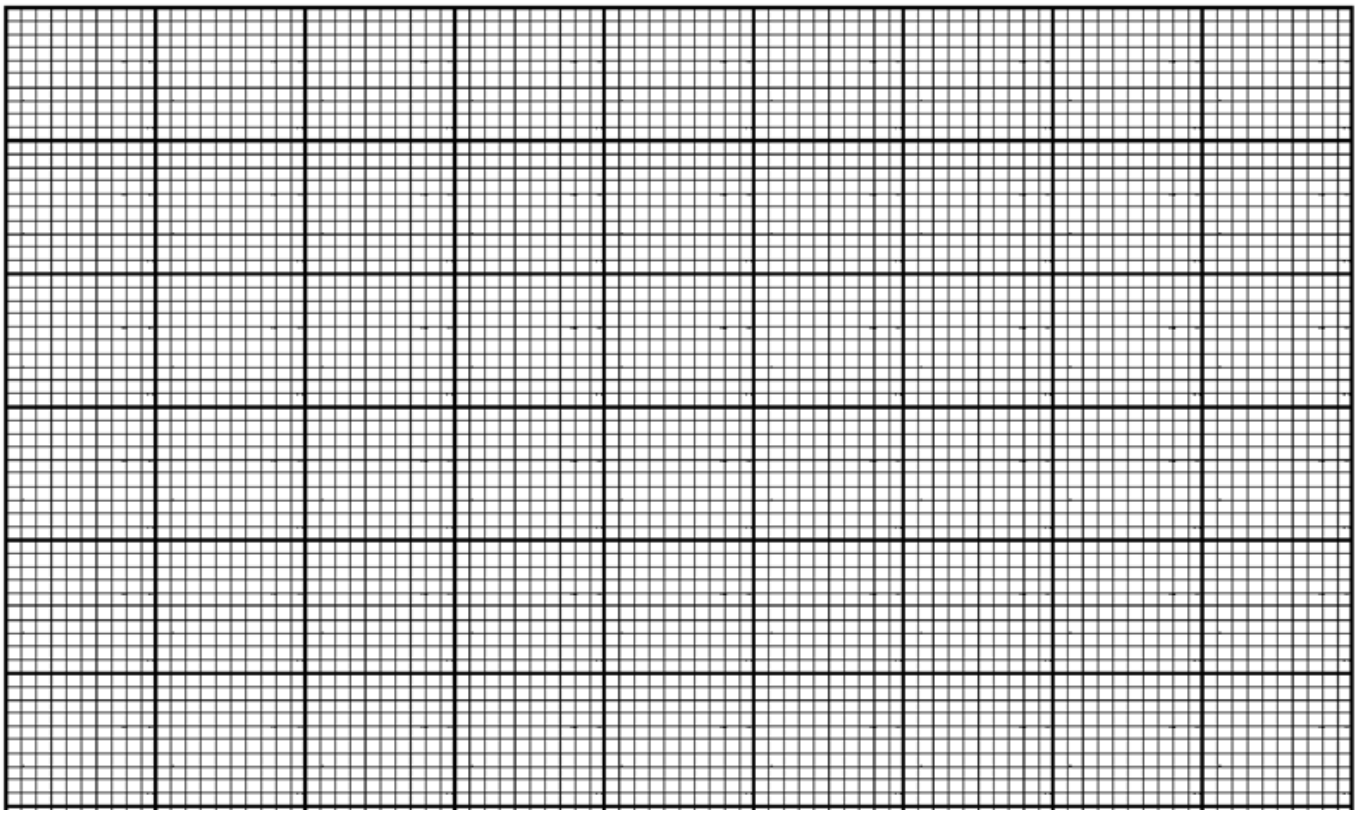
Continued/…

b. Table 1 below shows the marks in mathematics test by form four students at Jenin Secondary School.

Marks	Frequency
11 - 15	7
16 - 20	4
21 - 25	8
26 - 30	3
31 - 35	5

i. Using a scale of 2 cm to represent 2 units on the vertical axis, draw the frequency polygon for the data. **(5marks)**

ii. State the modal mark interval **(1 mark)**



5. a. **Figure 1** shows a triangular prism with $\boldsymbol{AD} = 6cm, \boldsymbol{DE} = 15\ cm$ and $\boldsymbol{EF} = 8\ cm$.

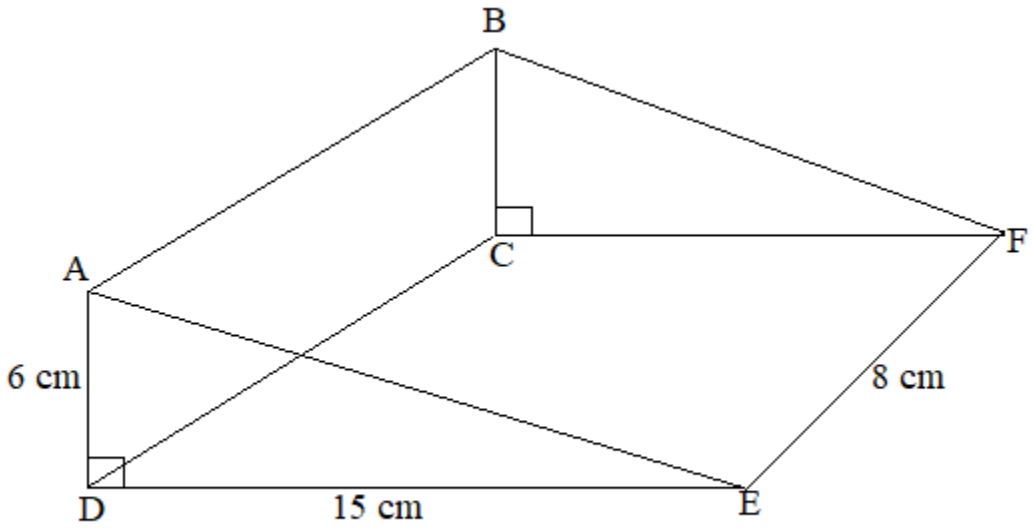


Figure 1

Calculate the angle between line AF and the base DCFE, correct to 1 decimal place. **(5 marks)**

b. In **figure 2**, ABC is a tangent to the circle **BDE** at **B**. **ADE** is a straight line.

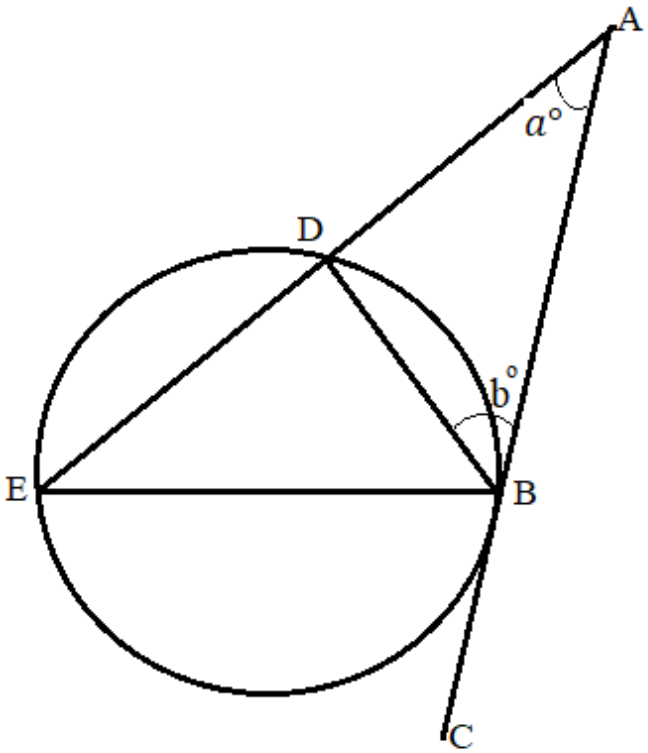


Figure 2

Given that angle **ABD**= $b°$ and angle **BAE** = angle **DBE**= $a°$, show that **EB** is a diameter

(5 marks)

6. a. solve the following logarithmic equation $\log_x\left(\frac{x-x^2}{2}\right) = 3$ **(6 marks)**

Continued/…

b. Using a pair of compasses and a ruler only, construct in the same diagram:

- a circle Centre **O** of radius 3 cm.
- a point **T** outside the circle and 9 cm from the centre **O.**
- tangent TA to the circle at A. **(5 marks)**

Continued/…

Section B (40 marks)

Answer any **four** questions from this section in the spaces provided.

7. Solve the following simultaneous equations: **(10 marks)**

$$y - 2x = 1$$
$$x^2 + xy = 4$$

Continued/...

8. The quantity y consists of the sum of two parts. The first part is directly proportional to x and the second part is inversely proportional to x. If $y = 11$, when $x = 1$, and $y = 10$, when $x = \frac{1}{2}$, find the value of y when $x = 3$ **(10 marks)**

Continued/…

9. (i) Copy and complete the table for the equation $y = x^3 + 2x^2 - 5x - 6$

x	-4	-3	-2	-1	0	1	2	3
y	-18	0	4		-6		0	24

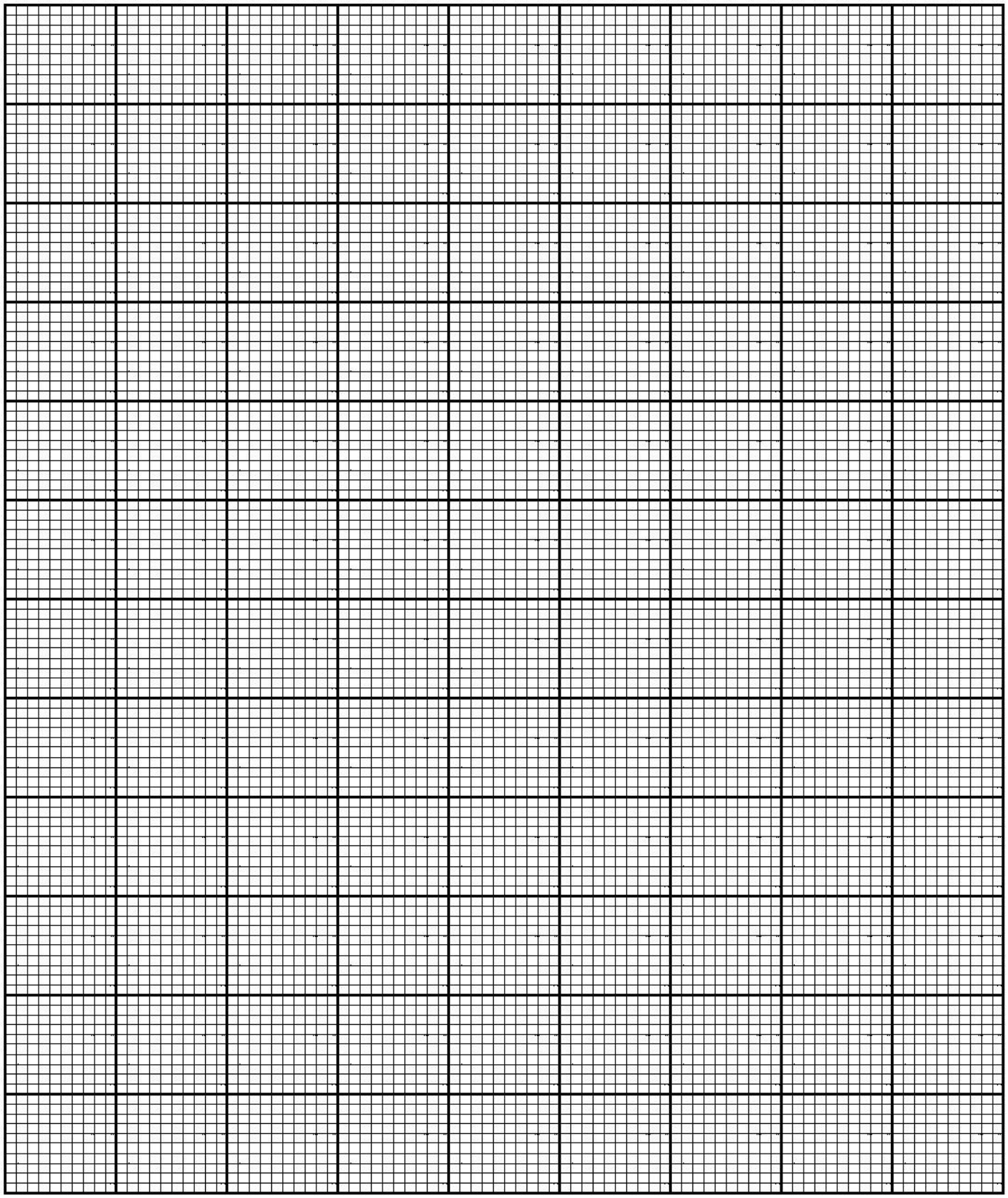
(2 marks)

(ii) Using a scale of 2 cm to represent 1 unit on the horizontal axis and 2cm to represent 5 units on vertical axis, draw the graph of $y = x^3 + 2x^2 - 5x - 6$. **(5 marks)**

(iii) Use your graph to solve the simultaneous equations

$y = x^3 + 2x^2 - 5x - 6$

$y = x - 4$ **(3 marks)**



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10. The 20th term of an Arithmetic progression **(AP)** is twice the 10th term. If the sum of the first 28 terms of the progression is 4872, find the 30th term. **(10 marks)**

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11. Mr Phiri would like to buy a second hand laptop and desktop. He has a total of **K2,400 000** to buy laptops and desktops. Each laptop costs **K60,000** and each desktop costs **K80,000.** He plans to buy not less than 20 computers altogether and at least 4 desktops.
    a. If x represents the number of laptops and y the number of desktops, write down four inequalities that satisfy the information above. **(3 marks)**
    b. Using a scale of 2cm to represent 5 units on both axes, draw graphs on the graph paper provided to show the region represented by the four inequalities by shading the unwanted region. **(4 marks)**
    c. Mr Phiri wishes to make a profit of **K10,000** for selling a laptop and **K20,000** for selling a desktop. Use the graphs to find the maximum number of laptop and desktops he can buy to make maximum profit. **(3 marks)**

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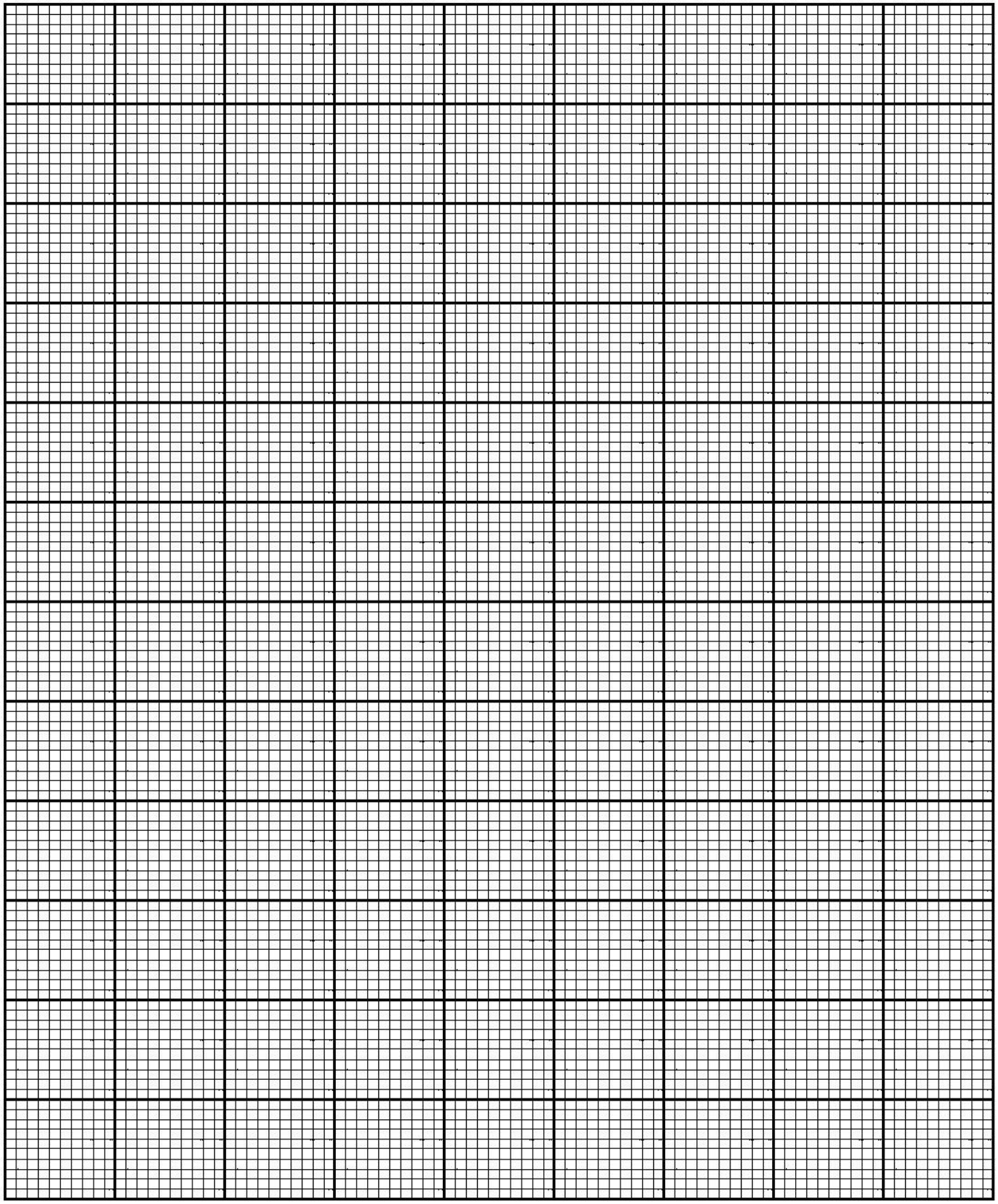

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12. In a school, 33 students were asked to choose their favourite subjects among Mathematics, Biology and History.
    - x students chose all the three subjects
    - 7 students chose Mathematics and Biology
    - 6 students chose Mathematics and History.
    - 5 students chose Biology and History
    - 3 students chose Biology only
    - 4 students chose Mathematics only
    - 10 students chose History only.
    - 4 students did not like any of the three subjects

    a. Present the information in a Venn diagram. **(5 marks)**

    b. Use the Venn diagram to calculate the number of students who chose Biology **(5 marks)**

END OF QUESTION PAPER

NB: This paper contains 18 printed pages