**Name: ……………………………………………….. Index No:………………………………….**

**School: …………………………………………….. Candidate’s Sign:…………………………**

**Date: …………………………………………………**

**PAPER 1**

**121/1**

**MATHEMATICS**

**FORM 4**

**TIME: 21/2 HOURS**

**SEPTEMBER/OCTOBER 2021**

**INSTRUCTIONS TO THE CANDIDATES**

* *Write* ***your name*** *and* ***index number*** *in the spaces provided above*
* *This paper contains two sections;* ***Section A*** *and* ***Section B***
* *All workings and answers must be written on the question paper in the spaces provided below each question.*
* *Marks may be given for correct working* ***even if*** *the answer is wrong.*
* *Show all the steps in your calculations, giving your answers at each stage in the spaces below each question.*
* ***This paper consists of 15 printed pages.***
* ***Candidates should check carefully to ascertain that all the pages are printed as indicated and no questions are missing.***

**FOR EXAMINER’S USE ONLY**

**Section A**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Question | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Total |
| Marks |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**Section B** **GRAND TOTAL**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Question | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | **Total** |
| Marks |  |  |  |  |  |  |  |  |  |

**Section A. (50mks)**

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

1. Without using a calculator evaluate. (3mks)
2. Use logarithms to evaluate (4mks)
3. Without using a calculator or mathematical tables evaluate. (3mks)

¾

1. The base of a right pyramid is a rectangle of length and width each slant edge of the pyramid is. Calculate the volume of the pyramid. (3mks)
2. Simply. (3mks)

1. A two digit number is such that, the sum of its digits is 13. When the digits are interchanged the original number is increased by 9. Find the original number. (4mks)
2. The size of an interior angle of a regular polygon is while its exterior is 2. Find the number of triangles that makes the polygon. (3mks)
3. In the triangle below = 14cm and. Calculate; correct to 4 significant figures the areas of triangle. (3mks)

A

B 14cm C

1. A vector given by transforms a point to Find the distance (3mks)
2. Using a rule and a pair of compasses only, construct a quadrilateral in which 5cm, and (2mks)

(b)The quadrilateral represents a plot of land drawn to a scale of 1:4000. Determine the actual length of RS in metres. (2mks)

1. Without using mathematical tables or calculator evaluate. (3mks)
2. Use matrix method to solve. (3mks)
3. Use mathematical tables to find the reciprocal of hence evaluate. (4mks)

Correct to 2 decimal places.

1. A Kenyan businessman intended to buy goods worth US dollar from South Africa. Calculate the value of the goods to the nearest south Africa (S.A) Rand given that 1 US dollar = Ksh and 1 S.A Rand = Ksh . (3mks)
2. Find all integral values of which satisfy the inequalities. (3mks)
3. Express and in terms of its prime factors hence determine the value of

(4mks)

**Section B (50mks)**

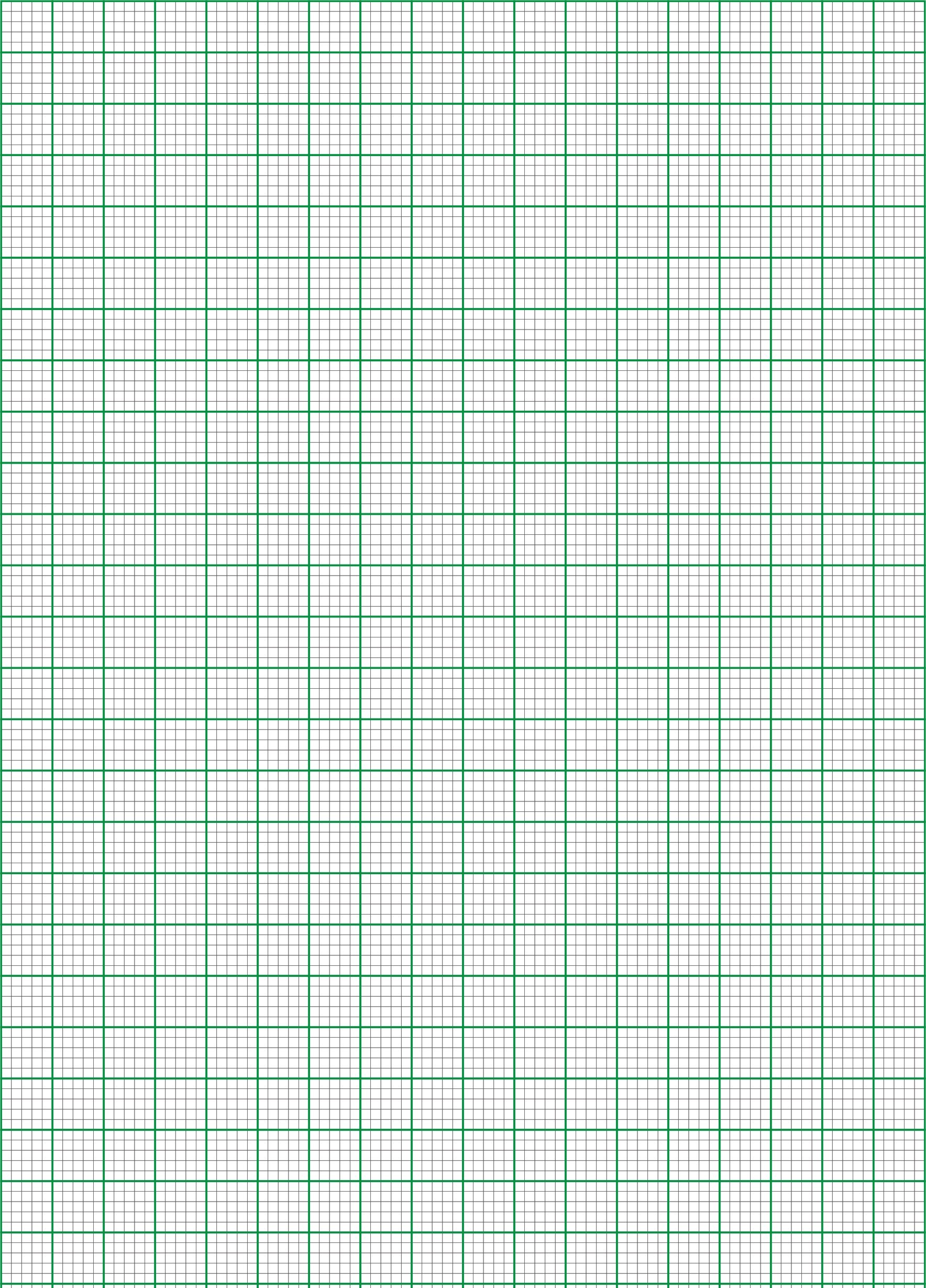
**Answer any five questions from this section on the spaces provided**.

1. Two vertices of a rectangle are and
2. Find the equation of line. (3mks)
3. Find the equation of the perpendicular bisector of line. (4mks)
4. Given that BC is perpendicular to AB. Find the equation of. (3mks)
5. Three business partners Abila, Bwire and Chirchir contributed Ksh , Ksh and Ksh respectively to boost their business. They agreed to put 20% of the profit accrued back into the business and to use 35% of the profits for running the business. The remainder was to be shared among the business partners in the ratio of their contribution. At the end of the year, a gross profit of Ksh was realised.
6. Calculate the amount.
7. Put back into the business. (2mks)
8. Used for official operations. (1mk)
9. Calculate the amount of profit each partner got. (4mks)
10. If the amount put back into the business was added to individual’s shares proportionately of their initial contributions, find the amount of Chirchir’s new shares. (3mks)
11. Coast bus left Nairobi at 8.00Am and travelled towards Mombasa at an average speed ofAt 8.300am Lamu bus left Mombasa towards Nairobi at an average speed of given that the distance between Nairobi and Mombasa is, determine.
12. The time Lamu bus arrived in Nairobi. (2mks)
13. The time the two buses met. (4mks)
14. The distance from Nairobi to the point where the buses met. (2mks)
15. How far coast bus is from Mombasa when Lamu bus arrives in Nairobi. (2mks)
16. A land is enclosed by four straight boundaries and. Point is 25Km on bearing of from A, C is directly south of on a bearing of from and is 30Km on a bearing of from
17. Using a scale of 1cm to represents 5Km represent the above information on a scale drawing. (3mks)
18. Using the scale drawing, determine the
19. Distance in Kilometres of from. (2mks)
20. Bearing of A from. (1mk)
21. Calculate the area, correct to 1 decimal place, of the land in square kilometres. (4mks)
22. Complete the table below for the functions

(2mks)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|  | 0 | - | - | 9 | 16 | 25 | - |
|  | - | -6 | -12 | - | - | - | -36 |
|  | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
|  | 7 | - | -1 | -2 | - | - | - |

(b) On the grid provided below draw the graph of for 0 and use it to estimate the roots of the equation.

 (4mks)

(c)Use the graph above to solve the equation (3mks)

(d) Determine the range of values of X for which (1mk)

1. In the figure below PQR and S are points on the circumference of the circle centre O. TP and TR are tangents to the circle at P and R respectively. POQ is a diameter of the circle and angle PQR = (10mks)

Q

R

O

S

P

T

Giving reasons on each case, find the size of

1. The figure below shows two triangles and with a common base = 3,4cm. The area of triangle = Area of triangle and

A D

7.2cm

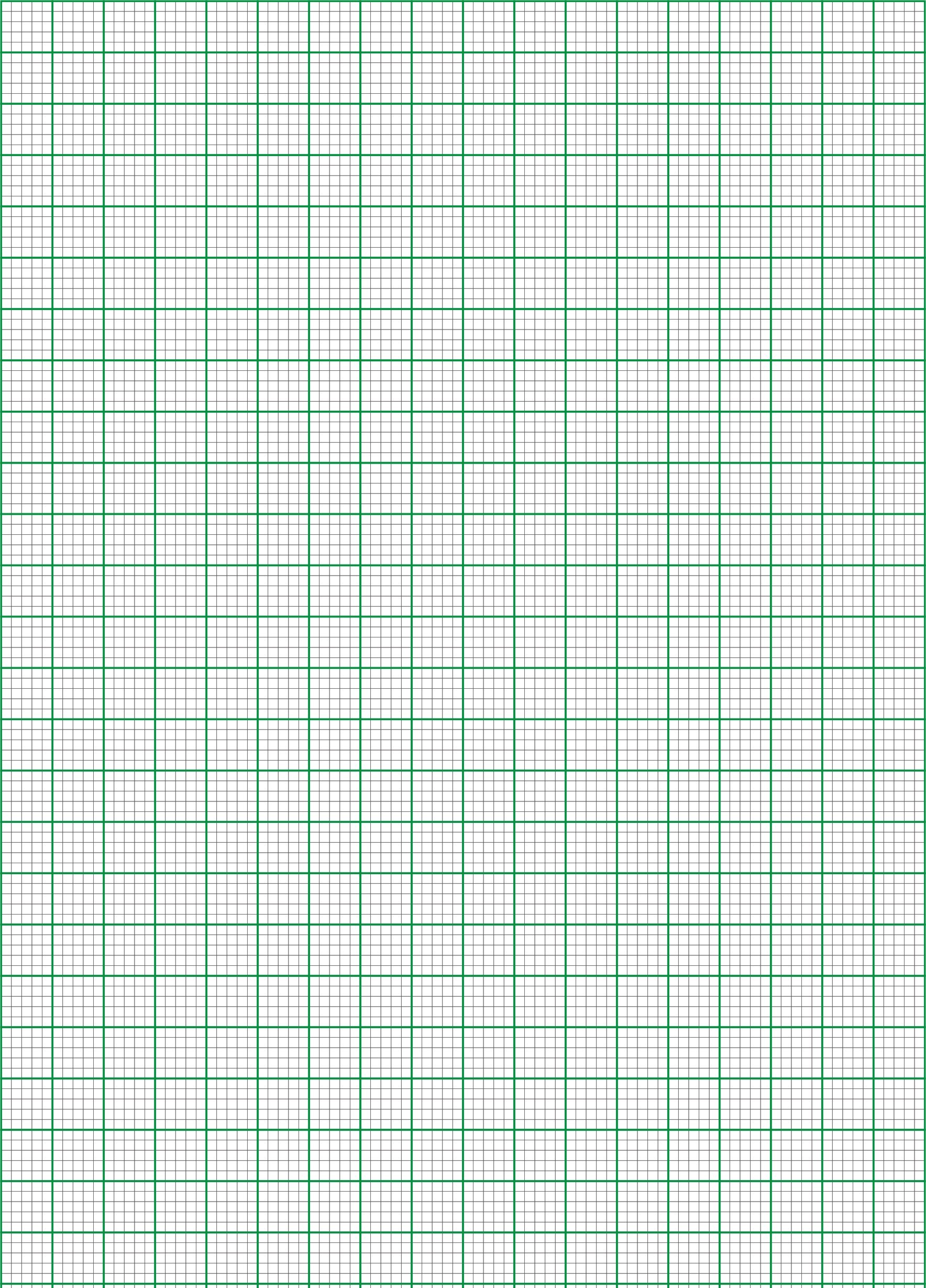
7.5cm

3.4cm

B C

1. Calculate, correct to one decimal place.
2. The area of triangle ABC. (3mks)
3. The size of (3mks)
4. The length of BD (2mks)
5. The size of (2mks)
6. The marks scored by 40 students in a mathematics test were as shown in the table below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Marks | 48 – 52 | 53 – 57 | 58 – 62 | 63 – 67 | 68 – 72 | 73 – 77 |
| Number of students | 3 | 4 | 10 | 12 | 8 | 3 |

1. State the modal class. (1mk)
2. Using an assumed mean of 64, calculate the mean mark. (3mks)
3. On the grid provided, draw the cumulative frequency curve for the data. (3mks)
4. Use the graph to estimate the semi- **i**nterquartile  range (3mks)