STUDENT ID _____ CLASS: _____

LOYOLA JESUIT SECONDARY SCHOOL

2021 JUNIOR CERTIFICATE MOCK EXAMINATIONS

MATHEMATICS

Subject Number: J131
Time Allowed: 2hours

8:00-10:00am

(100 marks)

Instructions

1. **This paper contains 12 printed pages. Please Check**
2. Answer **all** the **15** questions in section **A** and all the **five** questions 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 calculator may be used
6. All working must be clearly shown
7. Write your **Examination number** at the top of each page of your question in the spaces provided
8. 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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Total			

SECTION A (70 marks)

Answer All the 15questions

1. Convert 11011_2 to base 10 (3marks)

2. Find the H.C.F of the following terms $6a^2b$ and $15a^3b^2$ (3marks)

3. a.$if\ m = 5, n = -3\ and\ p = 4$, evaluate $\frac{p-n+1}{m+n}$(3marks)

   b. Simplify $(3x)^2 \times (\frac{1}{9}x^2)^{\frac{1}{2}}$(4marks)

4. a. Given that a bag has x green balls and 15 red balls. If the probability of picking a green ball is $\frac{2}{7}$, calculate the number of green balls (4marks)

b. in fig 1, BD = 5 cm, DC = 12 cm and AB = 6 cm.

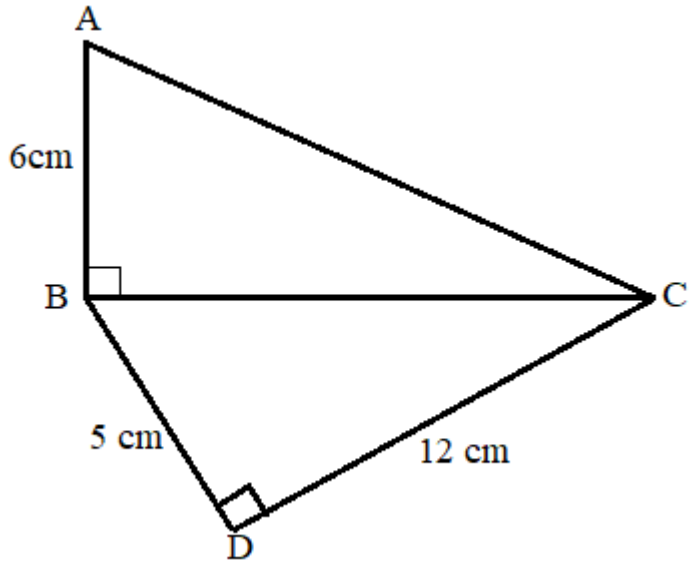


Fig 1

Calculate the area of the triangle ABC (4marks)

5. Solve the inequality $10 \leq 2x < x + 9$ and show the results on a number line (4marks)

6. Fig 2 shows some angles of polygon

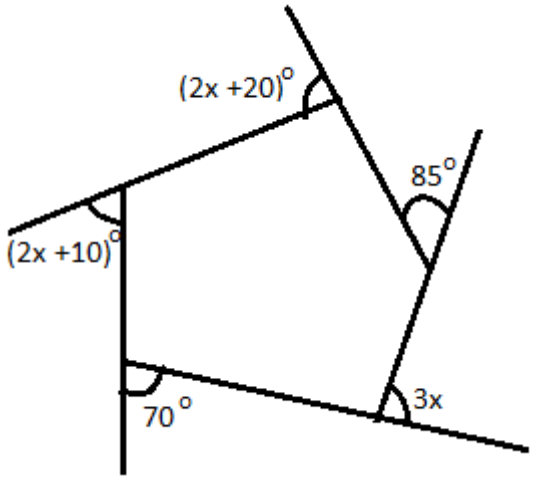


Fig2

Find the value of x (4marks)

7. In a group of 20 students: 14 like sports, 13 like music and 2 like neither sports nor music. Using a Venn diagram, calculate the number of pupils who like sports only (5marks)

8. A scientist mixed 15 cm^3 of a chemical of density $0.8g/cm^3$ with 10 cm^3 of a chemical with density $1.4g/cm^3$ (5marks)

9. a. Make h the subject of the formula in the equation $A = 2\pi r^2 + 2\pi rh$(3marks)

   b. A boy scored 60% in English, 45% in Mathematics, 68% in chemistry, 70% in Physics and y % in Biology. If his mean marks is 62%, calculate his score in Biology (4marks)

10. Fig 3 shows similar triangles ABC and ADE, AB = 4cm, BC =10 cm, DE = 15 cm and BD = x cm.

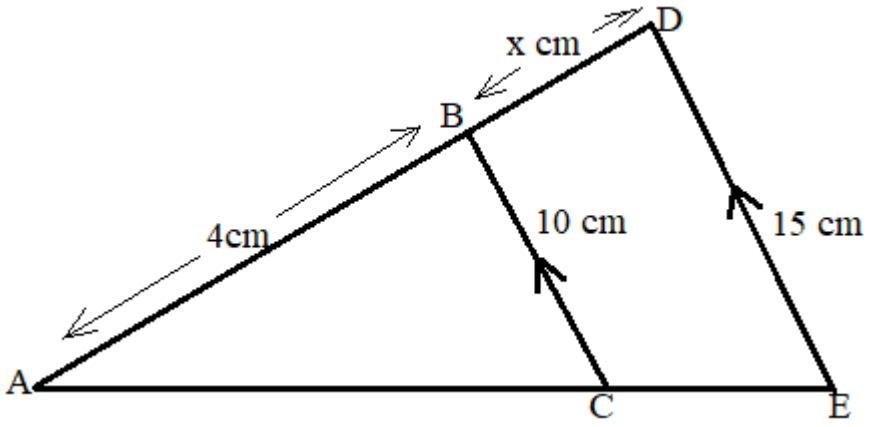


Fig 3

Find the value of x (4marks)

11. A man insures yearly a house valued at K 2 000 000 at K 25.00 for every K1 000. Calculate the annual premium (3marks)

12. Using logarithms, evaluate $5.24^2 \times 8.97$ leaving your answer correct to 4 s.f
(4 marks)

13. Fig4 shows line PQU parallel to line STV. $\angle PQR = 38°, \angle RTS = 2y$ and $\angle QRT = 98°$

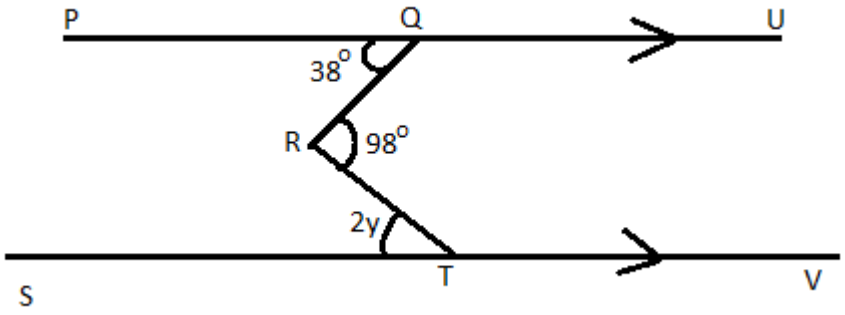


Fig 4

Calculate the value of y (4marks)

14. Solve the equation $2m^2 = 9m + 5$ (5marks)

15. Fig 5 shows triangle ABC

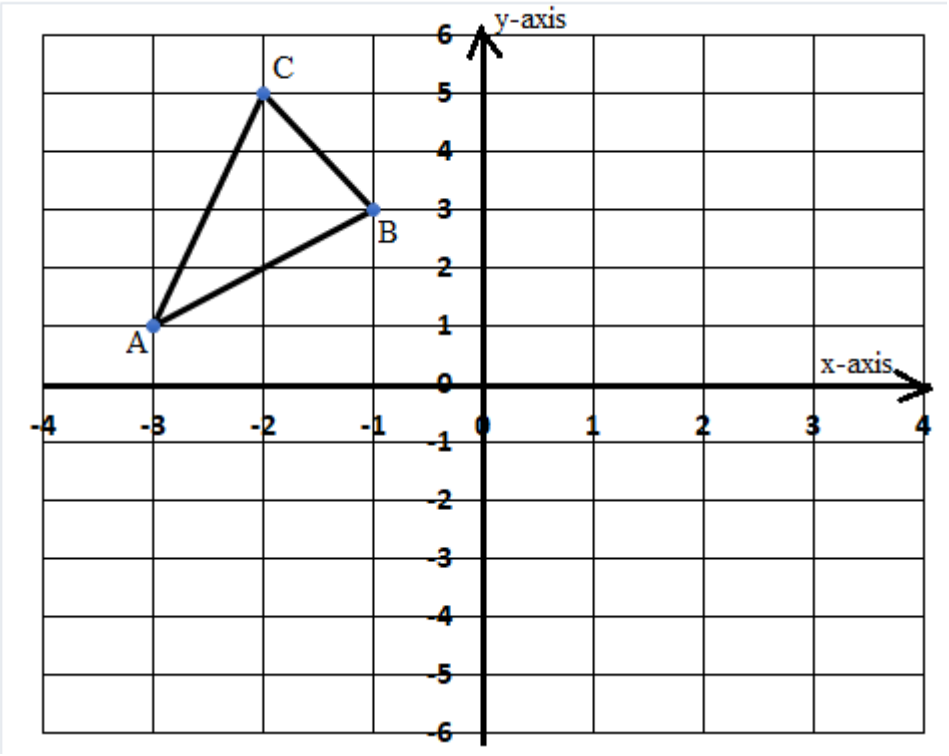


Fig 5

Draw the reflection of triangle ABC using y-axis as mirror line (4marks)

SECTION B (30 Marks)

Answer all the five questions in this section

16. A boy spent K675 in buying 3 pens at x kwacha each 5 books at y kwacha each. A girl spent K500 in buying 2 pens and 4 books at the same prices. By formulating simultaneous equations, calculate the price of a pen and price of a book (6marks)

17. Using a ruler and a pair of compasses only construct in the same diagram
    a. A triangle ABC with AB =6 cm, BC = 5 cm and AC = 4cm (2marks)
    b. A locus of points equidistant from lines AC and AB. Mark point X on the locus 8 cm from A. measure and state the length of BX (4marks)

18. a. Fig 6 below shows a right square based pyramid in which PQ = 8 cm and VX = 7 cm

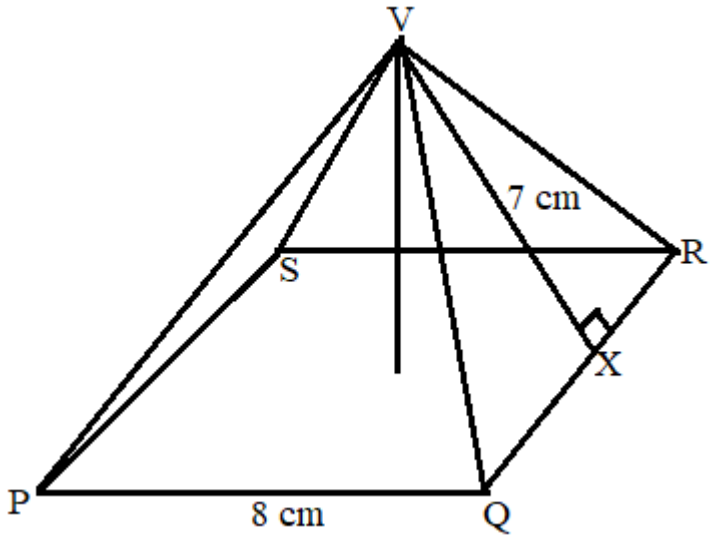
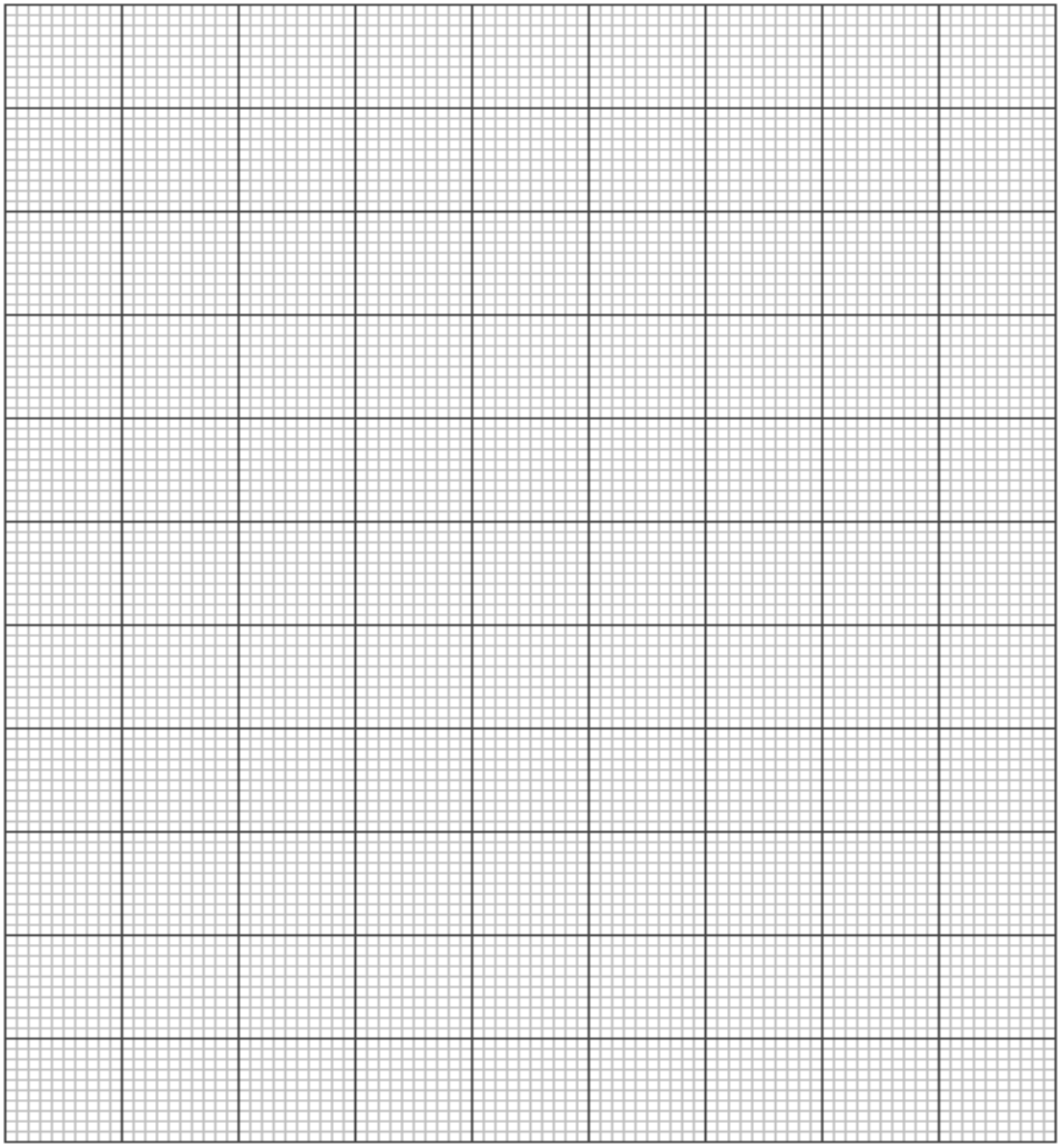


Fig 6

Calculate the total surface area of the pyramid (4marks)

b A sequence has the terms $-3,2,7,$ ... .find the n^{th} term formula (4marks)

19. Given that motorist X left village A at 6:00 am for village B, 120 Km away travelling at 50 Km/hr. for 1 hour. He then stopped for 15 minutes before he proceeds to arrive at village B at 9:00am. Motorist Y left village A for B 1 hour later after X had already left. He travelled non-stop at 80 Km/hr.
    a. Using a scale of 2 cm to represent 20 Km and 2 cm to represent 30 minutes, draw a distance time graph to show the journey of the motorists (5marks)
    b. Use the graph to find the time at which motorist Y did overtake motorist X (1mark)



20. Fig 7 shows triangles in which AB is parallel to DE and AC = CE

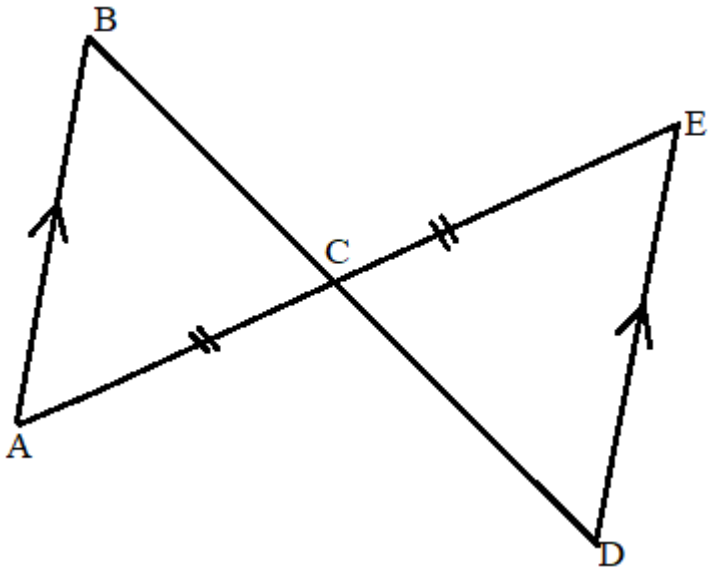


Fig 7

Prove that BC = DC (4marks)

END OF QUESTION PAPER!