CBSE EXAMINATION PAPER-2025

MATHEMATICS

(Solved)

Time allowed : 3 hours | Maximum Marks : 88

General Instructions :

Read the following instructions carefully and follow them :

i. This question paper contains **48 questions.** All questions are **compulsory.**

ii. This question paper is divided into **7 sections.**

iii. **Section A** – questions number **1 to 3** are case based questions

iv. **Section B** – questions number **4 to 4** are

assertion (a) : common difference of the ap : 5, 1, 3, 7,... is 4.

reason (r): common difference of the ap : a1, a2, a3 an is obtained

by d = an an 1.

v. **Section C** – questions number **5 to 7** are

assertion (a) : common difference of the ap : 5, 1, 3, 7,... is 4

reason (r): common difference of the ap : a_1, a_2, a_3,...., a_n is obtained by d = a_n a_{n-1}

vi. **Section D** – questions number **8 to 27** are multiple choice questions

vii. **Section E** – questions number **28 to 34** are very short answer

viii. **Section F** – questions number **35 to 42** are short answer

ix. **Section G** – questions number **43 to 48** are long answer

x. There is no overall choice given in the question paper. However, an internal choice has been provided in few questions.

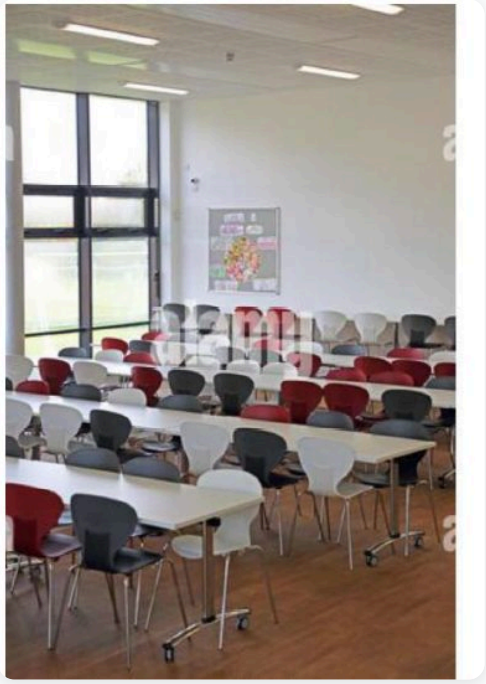
xi. Use of calculator is NOT allowed.

Section A

Question 1.

A school is organizing a grand cultural event to show the talent of its students. To accommodate the guests, the school plans to rent chairs and tables from a local supplier. It finds that rent for each chair is ₹50 and for each table is ₹200. The school spends ₹30,000 for renting the chairs and tables. Also, the total number of items (chairs and tables) rented are 300.

If the school 'x' chairs and 'y' tables, answer the following questions:



(1) Find the number of chairs and number of tables rented by the school.

[2 Marks]

(2) What is maximum number of tables that can be rented in ₹30,000 if no chairs are rented?

[1 Marks]

(3) Write down the pair of linear equations representing the given information.

[1 Marks]

(4)

If the school wants to spend a maximum of Rs 27,000 on 300 items (tables and chairs), then find the number of chairs and tables it can rent.

[2 Marks]

Question 2.

Rahul is a lucky charm for his cricket team. He has a jar of cards with

numbers from 10 to 74. Before each match, he draws a card from the jar. If the card bears an even number, the team wins. If the number is even and divisible by 5, they win by a big margin. If the number is an odd number less than 30, they win by a small margin. And if the number is a prime number between 50 and 74, they lose.

Answer the following questions if Rahul draws a card today :



(1) What is the probability that Rahul draws a card with an even number?

[1 Marks]

(2) What is the probability that Rahul draws a card with an odd number less than 30?

[1 Marks]

(3) What is the probability that Rahul draws a card with a prime number between 50 and 74?

[2 Marks]

(4)

What is the probability that Rahul draws a card with an even number divisible by 5 ?

[2 Marks]

Question 3.

A skilled carpenter decided to craft a special rolling pin for the local

baker. He carefully joined three cylindrical pieces of wood - two small

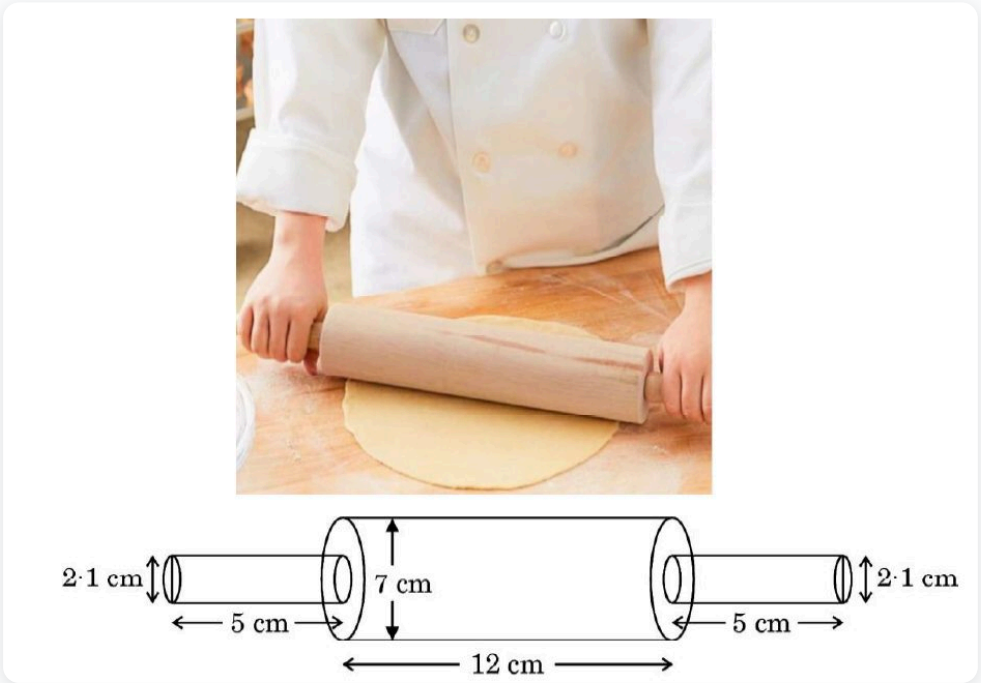
ones on the ends and one larger in the centre to create a perfect tool. The baker loved the rolling pin, as it rolled out the smoothest dough for breads and pastries.

The length of the bigger cylindrical part is 12 cm and diameter is 7 cm

and the length of each smaller cylindrical part is 5 cm and diameter is

2·1 cm.

Based on the above information, answer the following questions :



(1) Find the volume of the bigger cylindrical part.

[1 Marks]

(2) Find the curved surface area of the bigger cylindrical part.

[1 Marks]

(3)

Find the ratio of the volume of the bigger cylindrical part to the total volume of the two smaller (identical) cylindrical parts.

[2 Marks]

(4)

Find the sum of the curved surface areas of the two identical smaller cylindrical parts.

[2 Marks]

Section B

Question 4.

Section C

Question 5.

Question 6.

Question 7.

Section D

Question 8. If $7\cos^2\theta + 3\sin^2\theta = 4$, then the value of θ is:

[1 Marks]

(A) 30°

(B) 45°

(C) 60°

(D) 90°

Question 9.

The probability of drawing an even prime number out of numbers from 1 to 30 is:

[1 Marks]

(A) 7/30

(B) 4/15

(C) 0

(D) 1/30

Question 10.

The quadratic equation whose roots are 7 and 1/7 is:

[1 Marks]

(A) $7x^2 - 50x + 7 = 0$

(B) $7x^2 + 50x - 1 = 0$

(C) $7x^2 - 50x + 1 = 0$

(D) $7x^2 + 50x - 7 = 0$

Question 11.

The least number which is a perfect square and is divisible by each of 16, 20 and 50 is:

[1 Marks]

(A) 100

(B) 2400

(C) 3600

(D) 1200

Question 12.

The coordinates of the end points of a diameter of a circle are (5, -2) and (5, 2). The length of the radius of the circle is:

[1 Marks]

(A) ±2

(B) 4

(C) ±4

(D) 2

Question 13.

The points (−5,0), (5,0) and (0,4) are the vertices of a triangle which is a/an:

[1 Marks]

(A) scalene triangle

(B) equilateral triangle

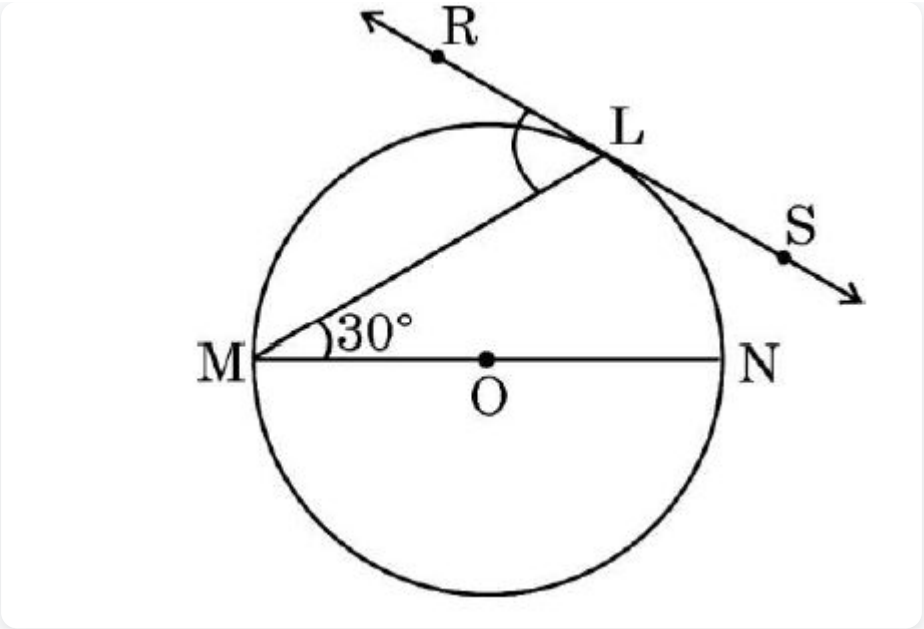
(C) isosceles triangle

(D) right-angled triangle

Question 14.

In the given figure, RS is the tangent to the circle at the point L and MN is the diameter. If ∠NML = 30°, then ∠RLM is:

[1 Marks]



(A) 30°

(B) 90°

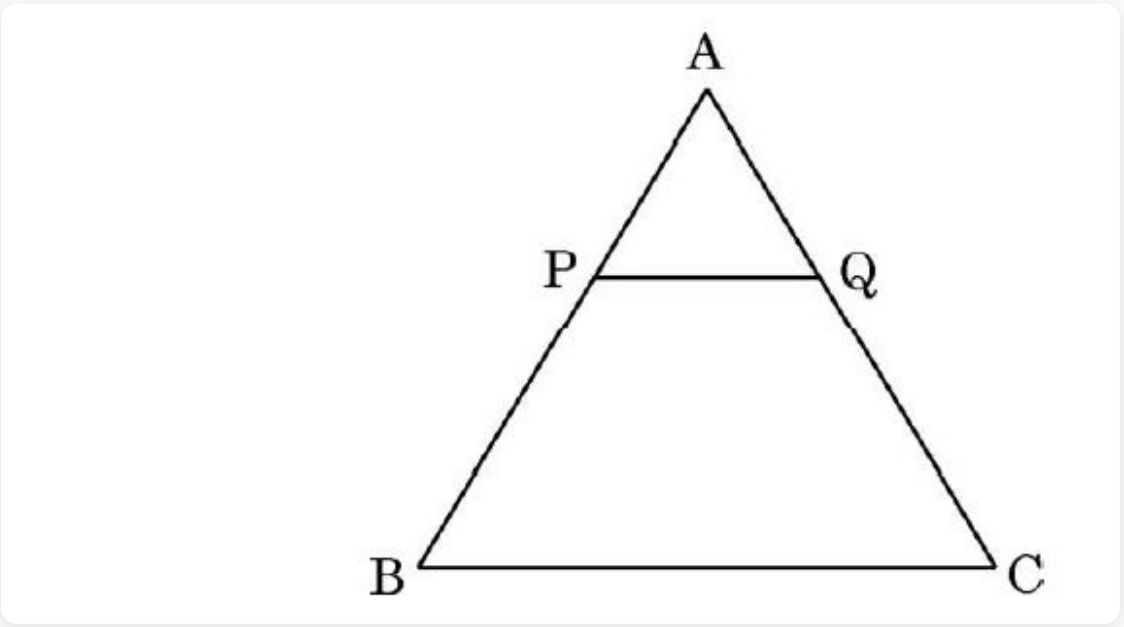
(C) 60°

(D) 120°

Question 15.

In the given figure, PQ || BC. If AP/ PB = 4 /13 and AC = 20.4 cm, then the length of AQ is:

[1 Marks]



(A) 4.8 cm

(B) 3.8 cm

(C) 5.8 cm

(D) 2.8 cm

Question 16. Which of the following statements is incorrect?

[1 Marks]

(A) A square and a rhombus of the same area are always similar.

(B) Two congruent figures are always similar.

(C) Two similar triangles need not be congruent.

(D) Two equilateral triangles are always similar.

Question 17. The sum of the exponents of prime factors in the prime factorisation of 4004 is:

[1 Marks]

(A) 5

(B) 4

(C) 3

(D) 2

Question 18.

In a cricket match, a batsman hits the boundary 7 times out of the 42 balls he plays. The probability of his not hitting a boundary is:

[1 Marks]

(A) 1/7

(B) 2/7

(C) 1/6

(D) 5/6

Question 19. If a large circular pizza is divided into 5 equal sectors, then the central angle of each sector will be:

[1 Marks]

(A) 60°

(B) 90°

(C) 45°

(D) 72°

Question 20.

If sin 30° tan 45° = sec 60° / k, then the value of k is:

[1 Marks]

(A) 3

(B) 2

(C) 1

(D) 4

Question 21. The line represented by the equation x - y = 0 is:

[1 Marks]

(A) parallel to x-axis

(B) parallel to y-axis

(C) passing through the origin

(D) passing through the point (3, 2)

Question 22.

The 10^{th} term of the AP

5, 19/4, 9/2, 17/4,... is.

[1 Marks]

(A) 11/4

(B) 4/13

(C) 4/11

(D) 13/4

Question 23.

If - 4 is a zero of the polynomial $p(x) = x^2 - x - (2 + 2k)$, then the value of k is:

[1 Marks]

(A) -9

(B) 9

(C) 6

(D) 3

Question 24. The equation of a line parallel to the x-axis and at a distance of 3 units below x-axis is:

[1 Marks]

(A) x = 3

(B) x = -3

(C) y = -3

(D) y = 3

Question 25. The HCF of 40, 110 and 360 is:

[1 Marks]

(A) 40

(B) 360

(C) 10

(D) 110

Question 26.

Assertion (A) : Common difference of the AP : 5, 1, -3,-7,... is 4 .

Reason (R): Common difference of the AP : a_1, a_2, a_3 .....a_n is obtained by d = a_n - a_{n-1}

[1 Marks]

(A) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

(B) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

(C) Assertion (A) is false, but Reason (R) is true.

(D) Assertion (A) is true, but Reason (R) is false.

Question 27.

Assertion (A) : The pair of linear equations $px + 3y + 59 = 0$ and $2x + 6y + 118 = 0$ will have infinitely many solutions if $p = 1$.

Reason (R): If the pair of linear equations $px + 3y + 19 = 0$ and $2x + 6y + 157 = 0$ has a unique solution, then $p \neq 1$.

[1 Marks]

(A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).

(B) Assertion (A) is false, but Reason (R) is true.

(C) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of the Assertion (A).

(D) Assertion (A) is true, but Reason (R) is false.

Section E

Question 28.

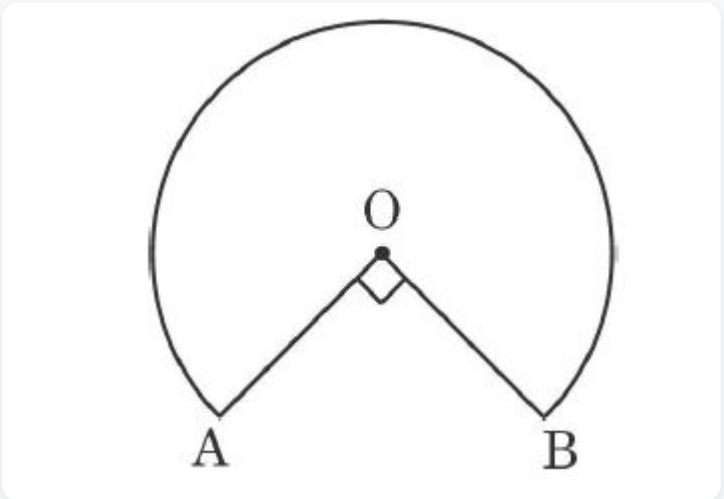
If p and q are zeroes of the polynomial $p(y) = 21y^2 – y – 2$, then find the value of $(1 - p).(1 - q)$.

[2 Marks]

Question 29.

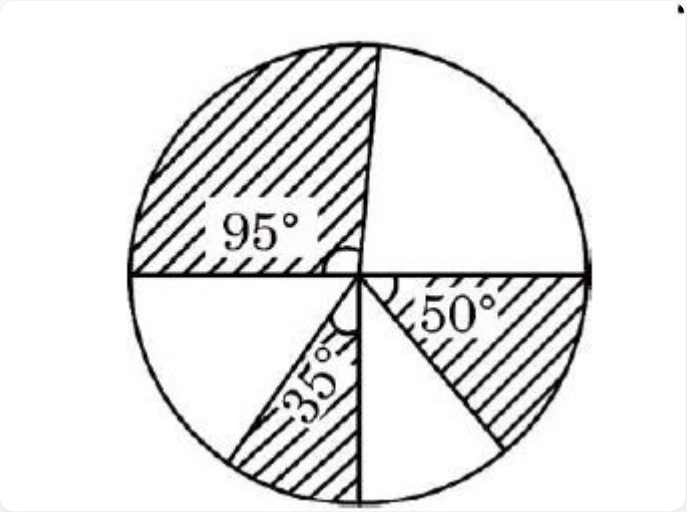
In the given figure, the shape of the top of a table is that of a sector of a circle with centre O and $\angle AOB = 90°$. If AO = OB = 42 cm, then find the perimeter of the top of the table.

[2 Marks]



Question 30. In the given figure, three sectors of a circle of radius 5 cm make angles 35°, 50°, and 95° at the centre. Find the area of the shaded region. [Use π = 22/7]

[2 Marks]



Question 31.

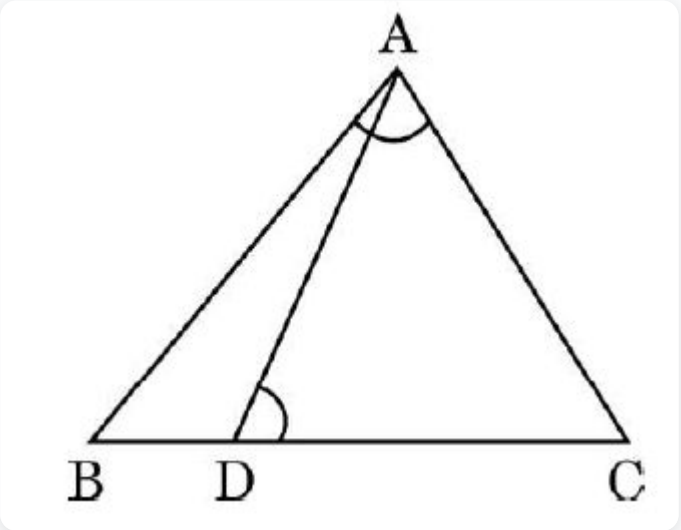
If tan A = √3, where A is an acute angle, then find the value of $\sin^2 A / 1 + \cos^2 A$

[2 Marks]

Question 32.

In the given figure, D is a point on side BC of ΔABC such that ∠ADC = ∠BAC. Show that $CA^2 = CD.CB$.

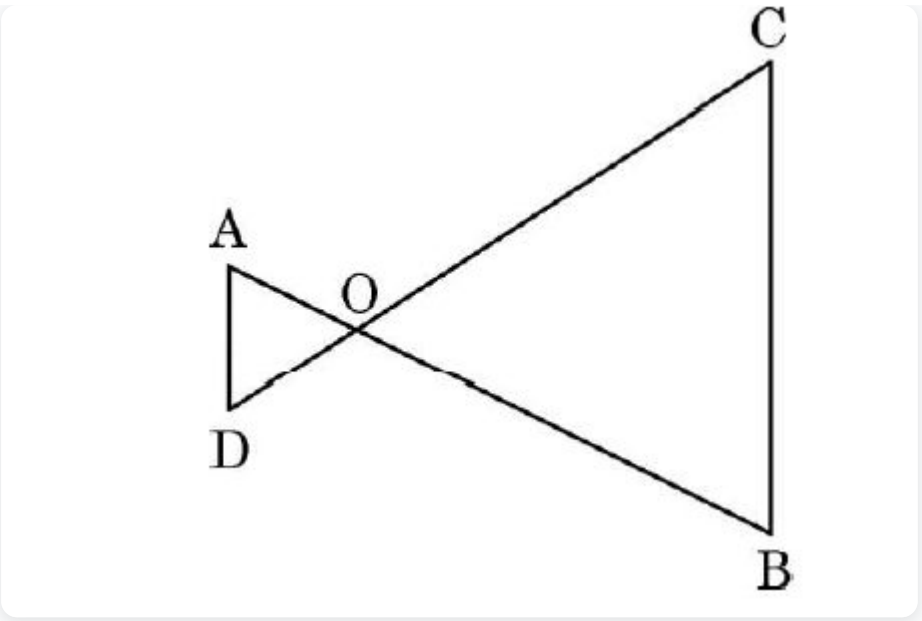
[2 Marks]



Question 33.

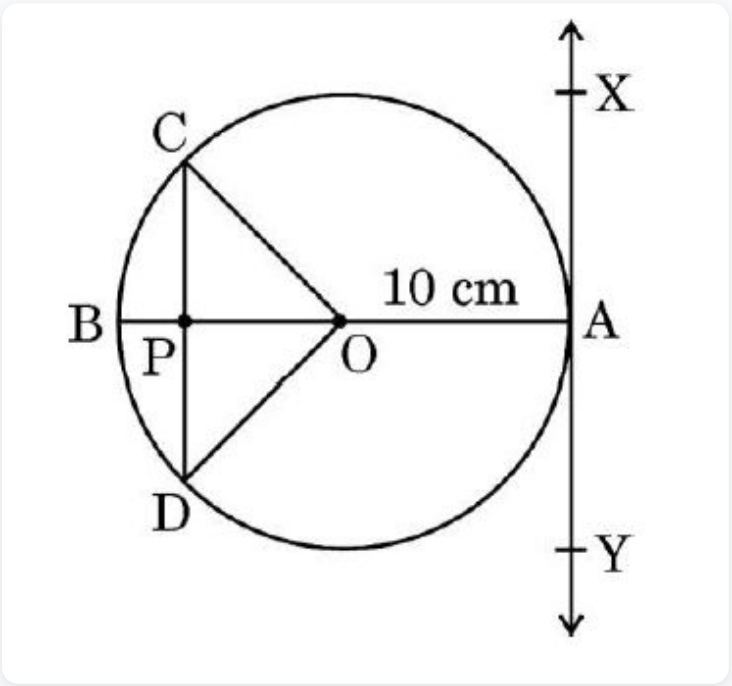
In the given figure, OA.OB = OC.OD. Show that ∠A = ∠C and ∠B = ∠D.

[2 Marks]



Question 34. At point A on the diameter AB of a circle of radius 10 cm, tangent XAY is drawn to the circle. Find the length of the chord CD parallel to XY at a distance of 16 cm from A.

[2 Marks]



Section F

Question 35. Prove that the parallelogram circumscribing a circle is a rhombus.

[3 Marks]

Question 36. Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line-segment joining the points of contact at the centre.

[3 Marks]

Question 37.

Prove that : $(1+ 1/\tan^2\theta)(1 + 1/ \cot^2\theta)= 1 / \sin^2\theta - \sin^4\theta$

[3 Marks]

Question 38.

Prove that : $\sqrt{\text{cosec}\theta-1}/\sqrt{\text{cosec}\theta + 1} + \sqrt{\text{cosec}\theta + 1}/\sqrt{\text{cosec}\theta -1} = 2\sec \theta$

[3 Marks]

Question 39. If the mid-point of the line segment joining the points A(3, 4) and B(k, 6) is P(x, y) and x + y - 10 = 0, then find the value of k.

[3 Marks]

Question 40. The length of the hour hand of a clock is 10 cm. Find the area of the minor sector swept by the hour hand of the clock between 5 a.m. to 8 a.m. Also, find the area of the major sector.

[3 Marks]

Question 41.

Prove that $\sqrt{3}$ is an irrational number.

[3 Marks]

Question 42.

A sum of ₹ 2,000 is invested at 7% per annum simple interest. Calculate the interests at the end of 1^{st}, 2^{nd} and 3^{rd} year. Do these interests form an AP? If so, find the interest at the end of the 27th year.

[3 Marks]

Section G

Question 43.

Two ships are sailing in the sea on either side of a lighthouse. The angles of depression to the two ships as observed from the top of the lighthouse are 60° and 45°, respectively. If the distance between the ships is $100 (1 + \sqrt{3} / \sqrt{3})$ m, then find the height of the lighthouse.

[5 Marks]

Question 44. The angles of depression of the top and the bottom of an 8 m tall building from the top of another multistoried building are 30° and 45°, respectively. Find the height of the multistoried building and the distance between the two buildings.

[5 Marks]

Question 45. The sum of the areas of two squares is 52 cm² and difference of their perimeters is 8 cm. Find the lengths of the sides of the two squares.

[5 Marks]

Question 46.

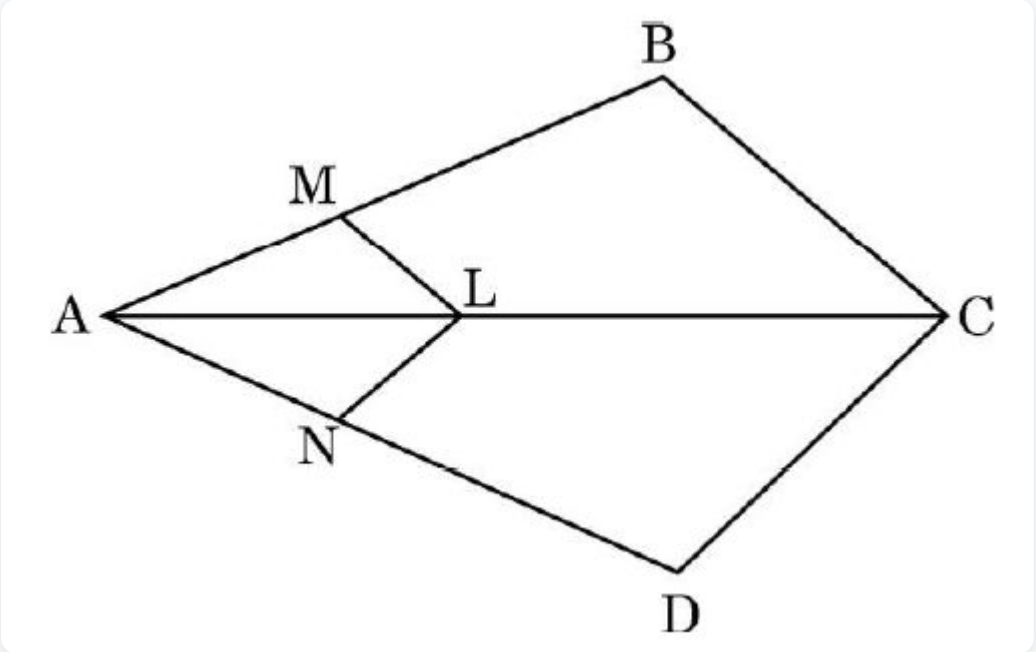
The time taken by a person to travel an upward distance of 150 km was 2x1/2 hours more than the time taken in the downward return journey. If he returned at a speed of 10 km/h more than the speed while going up, find the speeds in each direction.

[5 Marks]

Question 47.

Prove that a line drawn parallel to one side of a triangle to intersect the other two sides in distinct points divides the other two sides in the same ratio. Hence, in the figure given below, prove that AM/ MB= AN / ND where LM || CB and LN || CD.

[5 Marks]



Question 48.

Find the Mean and Mode of the following frequency distribution:

[5 Marks]

Class	*Frequency*
0 – 10	8
10 – 20	7
20 – 30	15
30 – 40	20
40 – 50	12
50 – 60	8
60 – 70	10