

ANNUAL EXAMINATION (2025-26)
CLASS IX SUBJECT: MATHEMATICS (041)
SET-A

M.M:80

TIME:3 Hrs.

General instructions:

• This question paper contains two parts: part I and II . Each part is compulsory. Part - I carries 20 marks and Part II - carries 60 marks.

• Part - I has objective type questions and Part - II has descriptive type questions.

Part I:

• It consists of section- A

• Section A comprises of 18 multiple choice questions and 2 Assertion Reason questions.

Part - II:

• It consists of 4 sections - B, C, D and E

• Section B comprises of 5 questions of 2 marks each.

• Section C comprises of 6 questions of 3 marks each.

• Section D comprises of 4 questions of 5 marks each.

• Section E has 3 case based integrated units of assessment (04 marks each)

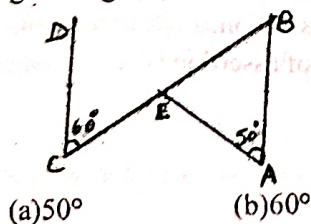
• Attempt only one of the alternatives in all the questions wherever internal choices are provided.

Part I

Section - A

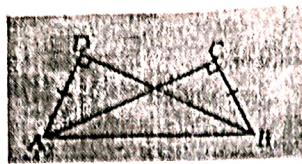
Multiple Choice Questions

1. Value of $256^{0.16} \times 256^{0.09}$ (1)
 (a) 4 (b) 16 (c) 64 (d) 256.25
2. If $x + \frac{1}{x} = 5$, value of $x^3 + \frac{1}{x^3}$ is: (1)
 (a) 104 (b) 125 (c) 110 (d) 5
3. If $x^{51} + 51$ is divided by $x + 1$, the remainder is: (1)
 (a) 0 (b) 1 (c) 49 (d) 50
4. The graph of the linear equation $2x + 3y = 6$, cuts the y- axis at the point: (1)
 (a) (2,0) (b) (0,3) (c) (3,0) (d) (0,2)
5. If $x=1$, $y=2$ is the solution of the equation $4x - ky = 9$ then the value of k is
 (a) -1 (b) $-5/2$ (c) 0 (d) $5/2$
6. AB is a straight line. C is the mid point of AB . D is the mid point of AC. Which of the following shows the relation between the line segments? (1)
 (a) $AD = \frac{1}{2} AB$ (b) $AD = \frac{1}{2} CB$ (c) $AD = 2 AC$ (d) $AD = 2 DC$
7. The number of dimensions a solid has: (1)
 (a) 1 (b) 2 (c) 3 (d) 0
8. In the given figure , AB || CD if $\angle EAB = 50^\circ$ and $\angle ECD = 60^\circ$, then find $\angle AEB$

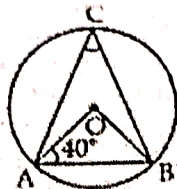


- (a) 50° (b) 60° (c) 70° (d) 55°
9. If one angle of a triangle is equal to the sum of the other two angles , then the triangle is: (1)
 (a) an isosceles triangle (b) an obtuse triangle (c) an equilateral triangle (d) a right triangle
10. In $\triangle ABC$, $BC = AB$ and $\angle B = 80^\circ$. Then $\angle A$ is equal to: (1)
 (a) 80° (b) 40° (c) 50° (d) 100°

11. In the figure below, it is given that $\triangle ABD \cong \triangle BAC$. What criteria is used to prove that the triangles are congruent? (1)



- (a) ASS (b) SSA (c) RIIIS (d) SSS (1)
12. In the given figure, if $\angle OAB = 40^\circ$, then $\angle ACB$ is equal to:



- (a) 50° (b) 40° (c) 60° (d) 70° (1)
13. If area of equilateral triangle is $225\sqrt{3} \text{ cm}^2$, then each of its sides is: (1)
- (a) 30cm (b) 35cm (c) 40cm (d) 45cm
14. The diagonals AC and BD of a parallelogram ABCD intersect each other at the point O. If $\angle DAC = 32^\circ$ and $\angle AOB = 70^\circ$, then $\angle DBC$ is equal to: (1)

- (a) 24° (b) 86° (c) 38° (d) 32°
15. The area of an isosceles triangle, having base 2cm and the length of one of the equal sides as 4cm is: (1)
- (a) $\sqrt{15} \text{ cm}^2$ (b) $\sqrt{15}/2 \text{ cm}^2$ (c) $2\sqrt{15} \text{ cm}^2$ (d) $4\sqrt{15} \text{ cm}^2$

16. The Total surface area of a solid hemisphere is 5940 cm^2 . Then the radius of the hemisphere is: (1)
- (a) $2\sqrt{70} \text{ cm}$ (b) $\sqrt{70} \text{ cm}$ (c) $6\sqrt{70} \text{ cm}$ (d) $3\sqrt{70} \text{ cm}$

17. In a frequency distribution, the mid value of a class is 10 and width of class is 8, then lower limit of the class is: (1)

- (a) 5 (b) 6 (c) 7 (d) 8
18. The radius of the cone is 4 cm and the height is 15 cm. An ice cream seller keeps $1/4$ th of it empty. What is the volume (in cm^3) of the empty part of the cone? (1)

- (a) 12π (b) 15π (c) 19π (d) 20π
19. Assertion(A): The point which lies on y-axis has its ordinate as 0. (1)
- Reason(R): The perpendicular distance of a point from y axis is called its abscissa.

- (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- (b) Both Assertion and Reason are true and Reason is not the correct explanation of assertion.
- (c) Assertion is true, but reason is false.
- (d) Assertion is false, but reason is true.

20. Assertion(A): Range is called the difference between the maximum and minimum values of a variable. (1)
- Reason(R): The number of times a variable occurs in a given data is called its range.

- (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- (b) Both Assertion and Reason are true and Reason is not the correct explanation of assertion.
- (c) Assertion is true, but reason is false.
- (d) Assertion is false, but reason is true.

PART II

Section B

VERY SHORT ANSWER TYPE QUESTIONS

21. Express $0.323232\dots$ in the form of p/q where p, q are integers and $q \neq 0$ (2)

OR

Represent $\sqrt{6.3}$ on the number line.

22. Simplify: $\sqrt{50} - \sqrt{98} + \sqrt{162}$ (2)

23. If $p(x) = x^2 - 4x + 3$, Evaluate: (2)

$$p(2) - p(-1) + p(1/2)$$

OR

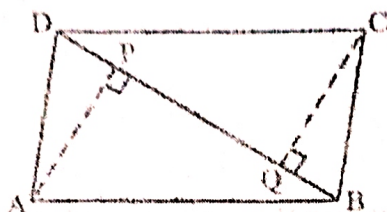
Without actually calculating the cubes, find the value of $(33)^3 + (-20)^3 + (-13)^3$

24. Prove that the angles opposite to equal sides of an isosceles triangle are also equal. (2)

25. ABCD is a parallelogram and AP and CQ are the perpendiculars from vertices A and C on diagonal BD. Show that: (2)

(i) $\triangle APB \cong \triangle CQD$

(ii) $AP = CQ$



Section C

SHORT ANSWER TYPE QUESTIONS

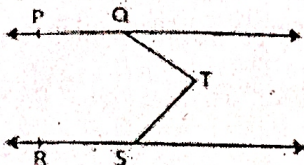
26. If both $x-2$ and $x-\frac{1}{2}$ are factors of px^2+5x+r , show that $p=r$. (3)

27. Point A(4,2), B(-1,2) and D(4,-5) are three vertices of a rectangle ABCD. Plot these points and hence find the vertex C. (3)

28. The auto rickshaw fare in a city is charged ₹10 for 1st kilometre and @ ₹4 per kilometre for subsequent distance covered. Write the linear equation to express the above statement. Also find two solutions for the linear equation. (3)

29. In the given figure $PQ \parallel RS$ and T is any point as shown in the figure.

Show that $\angle PQT + \angle QTS + \angle RST = 360^\circ$ (3)



OR

It is given that $\angle XYZ = 64^\circ$ and XY is produced to point P. Draw a figure from the given information. If ray YQ bisects $\angle ZYP$, find $\angle XYQ$ and reflex $\angle QYP$.

30. The Perimeter of an isosceles triangle is 32 cm. The ratio of the equal side to its base is 3 : 2. Find the area of triangle. (3)

31. The ratio between the volumes of two spheres is 8:27, find the ratio between their surface areas. (3)

OR

The circumference of the base of a 10 m high conical tent is 44 m. Calculate the length of the canvas used in making the tent if width of the canvas is 2m.

Section D

LONG ANSWER TYPE QUESTIONS

32. Prove that (5)

$$\frac{1}{3+\sqrt{7}} + \frac{1}{\sqrt{7}+\sqrt{5}} + \frac{1}{\sqrt{5}+\sqrt{3}} + \frac{1}{\sqrt{3}+1} = 1.$$

33. $\triangle ABC$ is a triangle right angled at C. A line through the mid point M of hypotenuse AB and parallel to BC intersects AC at D. Show that: (5)

(i) D is the midpoint of AC

(ii) $MD \perp AC$

(iii) $CM = MA = \frac{1}{2} AB$

OR

In parallelogram ABCD, two points P and Q are taken on diagonal BD such that $DP = BQ$. show that:

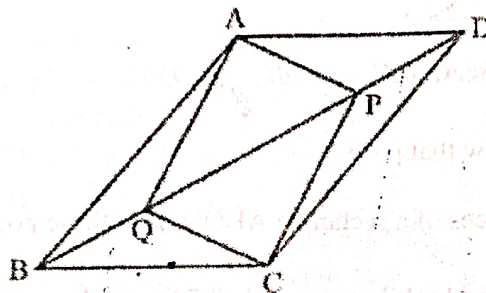
(i) $\triangle APD \cong \triangle CQB$

(ii) $AP = CQ$

(iii) $\triangle AQB \cong \triangle CPD$

(iv) $AQ = CP$

(v) APCQ is a parallelogram.



34. Prove that angle subtended by an arc at the centre is double the angle subtended by it on the remaining part of the circle. (5)

OR

ABCD is a cyclic quadrilateral whose diagonals intersect at point E. If $\angle DBC = 70^\circ$ $\angle BAC = 30^\circ$, find $\angle BCD$. Further if $AB = BC$ find $\angle ECD$

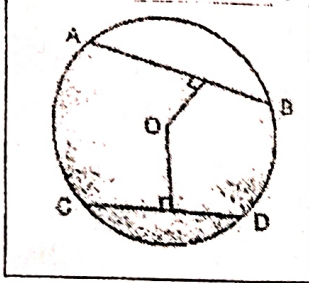
35. Draw a histogram to represent the following frequency distribution (5)

Marks	Number of students
0-20	7
20-30	10
30-40	10
40-50	20
50-60	20
60-70	15
70-100	8

SECTION E

CASE BASED QUESTIONS

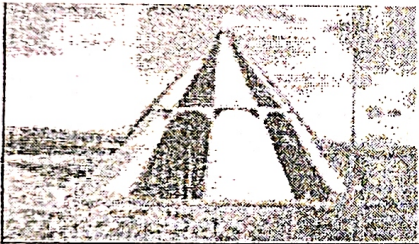
36. Rohan draws a circle of radius 10 cm with the help of compass and scale. He also draws two chords AB and CD in such a way that AB and CD are 6 cm and 8 cm from the centre O. Now, he has some doubts that are given below. Help him out by answering these questions:



- (1) What is the length of AB? (1)
 - (2) What is the length of CD? (1)
 - (3) Prove that perpendicular from the center of a circle to a chord bisects the chord (2)
- OR

Prove that equal chords subtend equal angles at the centre of the circle.

37. Once four friends Rahul, Arun, Ajay and Vijay went for a picnic at a hill station. Due to peak season they did not get a proper hotel in the city. The weather was fine so they decided to make a conical tent at a park. They were carrying 300 m² cloth with them. As shown in the figure they made the tent with height 10m and diameter 14 m. The remaining cloth was used for the floor.



- (i) What was the Slant height of the tent? (1)
- (ii) What was the area of the floor? (1)
- (iii) What was the volume of the tent? (2)

OR

What was the curved surface area of the tent?

38. Amit along with his four friends visited the house of Rohit, who was a common friend. There they met his father, who was having keen interest in mathematics. Rohit's father wanted to test the practical knowledge of all his friends, so he showed some objects like a cuboid shaped geometry box, a rectangular photo frame, a circular cardboard, square shaped files and a cube. He started asking the following questions one by one.

On the basis of the above information, solve the following questions:

- (i) If the area of a file is $4x^2 + 4x + 1$, what is the perimeter of this file? (1)
- (ii) If the area of the rectangular photo frame is $12x^2 - 7x + 1$, what are the possible dimensions of photo frame? (1)
- (iii) If the volume of cube is $8a^3 - b^3 - 12a^2b + 6ab^2$, what is the side of cube? (2)

OR

If the volume of geometry box is $3x^2 - 12x$. Find the possible dimensions of this geometry box.

END OF THE PAPER

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General instructions:

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Part - II:

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- Section C comprises of 6 questions of 3 marks each.
- Section D comprises of 4 questions of 5 marks each.
- Section E has 3 case based integrated units of assessment (04 marks each)
- Attempt only one of the alternatives in all the questions wherever internal choices are provided.

Part I

Section - A

Multiple Choice Questions

1. If $x + \frac{1}{x} = 5$, value of $x^3 + \frac{1}{x^3}$ is: (1)
 (a) 104 (b) 125 (c) 110 (d) 5
2. If $x^{31} + 31$ is divided by $x + 1$, the remainder is: (1)
 (a) 30 (b) 31 (c) 32 (d) -31
3. Value of $256^{0.16} \times 256^{0.09}$ (1)
 (a) 4 (b) 16 (c) 64 (d) 256.25
4. The graph of the linear equation $2x + 3y = 6$, cuts the x- axis at the point: (1)
 (a) (2,0) (b) (0,3) (c) (3,0) (d) (0,2)
5. If the graph of $2x + ky = 5$ passes through the point $(-2,1)$, the value of k is: (1)
 (a) 5 (b) 9 (c) $\frac{5}{4}$ (d) 1
6. AB is a straight line. C is the mid point of AB . D is the mid point of AC. Which of the following shows the relation between the line segments? (1)
 (a) $AD = \frac{1}{2} AB$ (b) $AD = \frac{1}{2} CB$ (c) $AD = 2 AC$ (d) $AD = 2 DC$
7. The number of dimensions a solid has: (1)
 (a) 1 (b) 2 (c) 3 (d) 0
8. If one angle of a triangle is equal to the sum of the other two angles , then the triangle is: (1)
 (a) an isosceles Δ (b) an obtuse Δ (c) an equilateral Δ (d) a right Δ
9. In the given figure , AB || CD if $\angle EAB = 50^\circ$ and $\angle ECD = 60^\circ$, then find $\angle AEB$ (1)



- (a) 50° (b) 60° (c) 70° (d) 55°

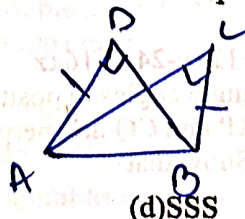
10. In the figure below, it is given that $\triangle ABD \cong \triangle BAC$. What criteria is used to prove that the triangles are congruent? (1)



(a) ASS

(b) SSA

(c) RHS



(d) SSS

11. In $\triangle ABC$, $BC = AB$ and $\angle B = 80^\circ$. Then $\angle A$ is equal to: (1)
 (a) 80° (b) 40° (c) 50° (d) 100°

12. The diagonals AC and BD of a parallelogram ABCD intersect each other at the point O. If $\angle DAC = 32^\circ$ and $\angle AOB = 70^\circ$, then $\angle DBC$ is equal to: (1)
 (a) 24° (b) 86° (c) 38° (d) 32°

13. In the given figure, if $\angle OAB = 40^\circ$, then $\angle ACB$ is equal to: (1)



(a) 50° (b) 40° (c) 60° (d) 70°

14. If area of an equilateral triangle is $196\sqrt{3} \text{ cm}^2$, then each of its sides is: (1)
 (a) $7\sqrt{3} \text{ cm}$ (b) $14\sqrt{3} \text{ cm}$ (c) 28 cm (d) 50 cm

15. The Total surface area of a solid hemisphere is 5940 cm^2 . Then diameter is (1)
 (a) $6\sqrt{70} \text{ cm}$ (b) $12\sqrt{70} \text{ cm}$ (c) $3\sqrt{70} \text{ cm}$ (d) $18\sqrt{70} \text{ cm}$

16. The radius of the cone is 4 cm and the height is 15 cm. An ice cream seller keeps $1/4$ th of it empty. What is the volume (in cm^3) of the empty part of the cone? (1)
 (a) 12π (b) 15π (c) 19π (d) 20π

17. In a frequency distribution, the mid value of a class is 10 and width of class is 6, then lower limit of the class is: (1)
 (a) 12 (b) 6 (c) 7 (d) 8

18. The area of an isosceles triangle, having base 2 cm and the length of one of the equal sides as 4 cm is: (1)
 (a) $\sqrt{15} \text{ cm}^2$ (b) $\sqrt{15/2} \text{ cm}^2$ (c) $2\sqrt{15} \text{ cm}^2$ (d) $4\sqrt{15} \text{ cm}^2$

19. Assertion(A): Range is called the difference between the maximum and minimum values of a variable. (1)

Reason(R): The number of times a variable occurs in a given data is called its range.

- (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
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20. Assertion(A): The point which lies on y-axis has its ordinate as 0. (1)

Reason(R): The perpendicular distance of a point from y axis is called its abscissa.

- (a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
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PART II

Section B

VERY SHORT ANSWER TYPE QUESTIONS

21. Simplify: $3\sqrt{45} - \sqrt{125} + \sqrt{200} - \sqrt{50}$

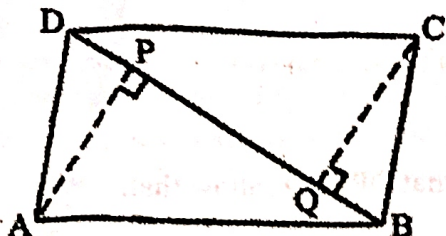
22. If $f(x) = x^2 + \sqrt{2}x + 1$, Evaluate $f(\sqrt{2}) - f(1)$ (2)

OR (2)

Factorise: $4x^2 + 9y^2 + 16z^2 + 12xy - 24yz - 16xz$

23. Prove that in an isosceles triangle angles opposite to equal sides are equal. (2)

24. ABCD is parallelogram and AP and CQ are perpendicular from vertices A and C on diagonal BD respectively. Show that (2)



(1) $\Delta APB \cong \Delta CQD$

(2) $AP = CQ$

25. Express $2.27272727\ldots$ in p/q form where p, q are integers and $q \neq 0$
OR

Represent $\sqrt{4.5}$ on the number line.

Section C

SHORT ANSWER TYPE QUESTIONS

26. Plot the points $A(5,5)$ and $B(-5,5)$ in cartesian plane. Join AB, OA, OB and name the figure so obtained. (3)

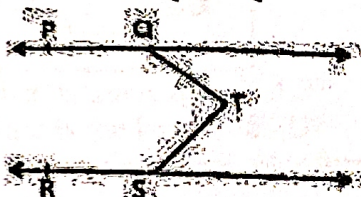
27. Determine the point in the graph of equation $2x+5y=20$ whose abscissa is $5/2$ times the ordinate. (3)

28. The perimeter of an isosceles triangle is 32cm. The ratio of the equal sides to its base is 3:2. Find the area of triangle. (3)

29. If both $(x-2)$ and $(x-\frac{1}{2})$ are two factors of px^2+5x+r , Show that $p=r$ (3)

30. In fig. $PQ \parallel RS$, and T is any point as shown in the fig. (3)

Show that $\angle PQT + \angle QTS + \angle RST = 360^\circ$



OR

It is given that $\angle XYZ = 64^\circ$ and XY is produced to point P . Draw a figure

from the given information. If ray YQ bisects $\angle ZYP$, find $\angle XYQ$ and reflex $\angle QYP$.

31. The ratio between the volume of two spheres is 8:27. What is the ratio between their surface areas. (3)

OR

The circumference of the base of a 10m high conical tent is 44m.

Calculate the length of the Canvas used in making the tent if width of the Canvas is 2m.

Section D

LONG ANSWER TYPE QUESTIONS

32. Prove that: (5)

$$\frac{1}{3+\sqrt{7}} + \frac{1}{\sqrt{7}+\sqrt{5}} + \frac{1}{\sqrt{5}+\sqrt{3}} + \frac{1}{\sqrt{3}+1} = 1$$

33. Prove that the angle subtended by an arc at the centre is double the angle subtended by it at any point on the remaining part of the circle. (5)

OR

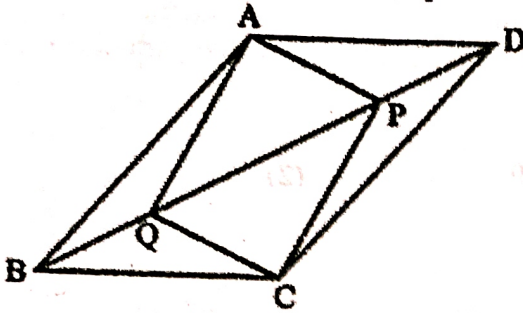
$ABCD$ is cyclic quadrilateral whose diagonals intersect at a point E .

If $\angle DBC = 70^\circ$, $\angle BAC = 30^\circ$. Find $\angle BCD$. Further if $AB = BC$, find $\angle ECD$.

34. ABC is a triangle right angled at C . A line through the midpoint M of hypotenuse AB and parallel to BC intersect AC at D . Show that (5)

- (1) D is the midpoint of AC
 - (2) $MD \perp AC$
 - (3) $CM = MA = \frac{1}{2}AB$
- OR

In parallelogram ABCD, two points P and Q are taken on diagonal BD such that $DP = BQ$. Show that:



- (1) $\triangle APD \cong \triangle CQB$
 - (2) $AP = CQ$
 - (3) $\triangle AQB \cong \triangle CPD$
 - (4) $AQ = CP$
 - (5) APCQ is a parallelogram
35. A random survey of the number of children of various age groups playing in a park was found as follows:

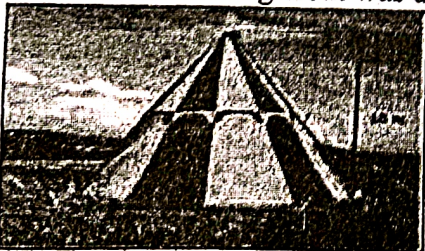
Age(in years)	Number of children
1-2	5
2-3	3
3-5	6
5-7	12
7-10	9
10-15	10
15-17	4

Draw a histogram to represent the data above.

SECTION E

CASE BASED QUESTIONS

36. Once four friends Rahul, Arun, Ajay and Vijay went for a picnic at a hill station. Due to peak season they did not get a proper hotel in the city. The weather was fine so they decided to make a conical tent at a park. They were carrying 300 m^2 cloth with them. As shown in the figure they made the tent with height 10m and diameter 14 m. The remaining cloth was used for the floor.



- (i) What was the Slant height of the tent?
- (ii) What was the area of the floor?
- (iii) What was the volume of the tent?

(1)
(1)
(2)

OR

What was the curved surface area of the tent?

37. Amit along with his four friends visited the house of Rohit, who was a common friend. There they meet his father, who was having keen interest in mathematics. Rohit's father wanted to test the practical knowledge of all his friends, so he showed some objects like a cuboid shaped geometry box, a rectangular photo frame, a circular cardboard, square shaped files and a cube. He started asking the following questions one by one.

On the basis of the above information, solve the following questions:

(i) If the area of a file is $4x^2 + 4x + 1$, what is the perimeter of this file? (1)

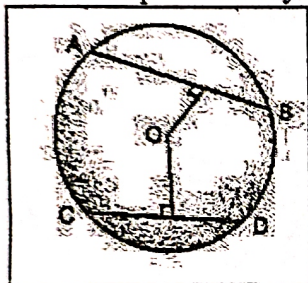
(ii) If the area of the rectangular photo frame is $12x^2 - 7x + 1$, what are the possible dimensions of photo frame? (1)

(iii) If the volume of cube is $8a^3 - b^3 - 12a^2b + 6ab^2$, what is the side of cube? (2)

OR

If the volume of geometry box is $3x^3 - 12x$. Find the possible dimensions of this geometry box.

38. Rohan draws a circle of radius 10 cm with the help of compass and scale. He also draws two chords AB and CD in such a way that AB and CD are 6 cm and 8 cm from the centre O. Now, he has some doubts that are given below. Help him out by answering these questions:



(1) What is the length of AB? (1)

(2) What is the length of CD? (1)

(3) Prove that perpendicular from the center of a circle to a chord bisects the chord (2)

OR

Prove that equal chords subtend equal angles at the centre of the circle.

END OF THE PAPER