



विद्या सर्वार्थ साधिका

ANANDALAYA  
ANNUAL EXAMINATION  
Class: IX

Subject: Mathematics  
Date : 01-03-2023

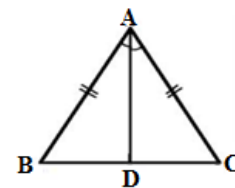
M.M :80  
Time : 3 hours

**General Instructions:**

1. This Question Paper has 5 Sections A-E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E.
8. Draw neat figures wherever required. Take  $\pi = 22/7$  wherever required if not stated.

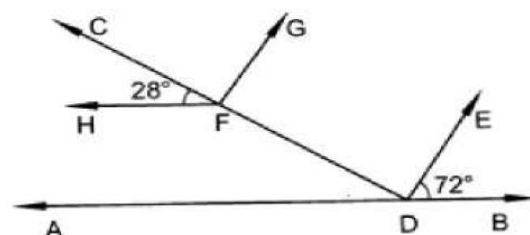
**SECTION - A**

1.  $0.12\bar{3}$  can be expressed in rational form as \_\_\_\_\_ (1)  
(A)  $\frac{111}{900}$  (B)  $\frac{900}{111}$  (C)  $\frac{10}{123}$  (D)  $\frac{121}{900}$
2. Which of the following equation has graph parallel to y -axis? (1)  
(A)  $y = -2$  (B)  $x = 1$  (C)  $x - y = 2$  (D)  $x + y = 2$
3. The things which are double of the same things are \_\_\_\_\_. (1)  
(A) Equal (B) unequal  
(C) halves of the same thing (D) double of the same thing
4. If  $x = -2$  and  $x^2 + y^2 + 3xy = -5$ , then find y. (1)  
(A)  $-2$  (B)  $3$  (C)  $-4$  (D)  $9$
5. In the adjoining figure,  $AB = AC$  and  $AD$  is bisector of  $\angle A$ . The rule by which  $\triangle ABD \cong \triangle ACD$ . (1)



- (A) SSS (B) SAS (C) AAS (D) ASA

6. Simplify:  $\sqrt[5]{243 a^{10} b^5 c^{10}}$ . (1)  
(A)  $3 a^3 b c^3$  (B)  $3 a^3 b c^2$  (C)  $3 a b^2 c^3$  (D)  $3 a^2 b c^2$
7. The volume of a sphere is  $388008 \text{ cm}^3$ . Find the radius. (1)  
(A) 41 cm (B) 18 cm (C) 21 cm (D) 36 cm
8. In the given figure  $AB \parallel HF$  and  $DE \parallel FG$ , then the measure of  $\angle FDE$  is \_\_\_\_\_. (1)



- (A)  $80^\circ$  (B)  $90^\circ$  (C)  $100^\circ$  (D)  $108^\circ$

9. Through two distinct points, there \_\_\_\_\_ . (1)  
 (A) is no line that passes through them. (B) is a unique line that passes through them.  
 (C) are two lines that pass through them. (D) are more than two lines that pass through them.
10. A rational number equivalent to a rational number  $\frac{7}{19}$  is \_\_\_\_\_. (1)  
 (A)  $\frac{17}{119}$  (B)  $\frac{14}{57}$  (C)  $\frac{21}{38}$  (D)  $\frac{21}{57}$
11. The length of each side of an equilateral triangle having an area  $9\sqrt{3} \text{ cm}^2$  is \_\_\_\_\_. (1)  
 (A) 6 cm (B) 12 cm (C) 16 cm (D) 9 cm
12. The area of the base of a right circular cylinder is  $154 \text{ cm}^2$  and its height is 15 cm. Find the volume of the cylinder. (1)  
 (A)  $2410 \text{ cm}^3$  (B)  $3210 \text{ cm}^3$  (C)  $2110 \text{ cm}^3$  (D)  $2310 \text{ cm}^3$
13.  $8y = 9$  when written as an equation in two variables, is \_\_\_\_\_. (1)  
 (A)  $x + 8y = 9$  (B)  $0x + 8y + 9 = 0$   
 (C)  $0x + 8y - 9 = 0$  (D)  $0x + 8y = 0$
14. In a parallelogram ABCD,  $\angle A = 115^\circ$ . The measure of  $\angle D$  is equal to \_\_\_\_\_. (1)  
 (A)  $115^\circ$  (B)  $65^\circ$  (C)  $135^\circ$  (D)  $165^\circ$
15. Write the degree of the given polynomial  $p(x)$  where,  $p(x) = 5x^3 + 4x^4 + x$ . (1)  
 (A) 2 (B) 3 (C) 4 (D) 5
16. The rational number between  $\frac{1}{2}$  and  $\frac{1}{3}$  is \_\_\_\_\_. (1)  
 (A)  $\frac{2}{5}$  (B)  $\frac{1}{5}$  (C)  $\frac{3}{5}$  (D)  $\frac{4}{5}$
17. The mid-value of a class interval is 25 and the class size is 8. The class interval is \_\_\_\_\_. (1)  
 (A) 21 – 30 (B) 21 – 29 (C) 19.5 – 27.5 (D) 16.5 – 36.5
18. Which of the following statement is not true? (1)  
 (A) Between two integers, there exist infinite numbers of rational numbers.  
 (B) Between two rational numbers, there exist infinite numbers of integers  
 (C) Between two rational numbers, there exist infinite numbers of rational numbers.  
 (D) Between two real numbers, there exists infinite number of real numbers.

For questions 19 and 20, two statements are given – one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below:

- (A) Both A and R are true and R is the correct explanation of the assertion  
 (B) Both A and R are true but R is not the correct explanation of the assertion  
 (C) A is true, but R is false  
 (D) A is false, but R is true

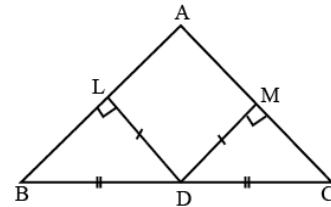
19. Assertion: If the angles of a quadrilateral are in the ratio 2 : 3 : 7 : 6, then the measure of angles are  $40^\circ, 60^\circ, 140^\circ, 120^\circ$ , respectively. (1)  
 Reason: The sum of the angles of a quadrilateral is  $360^\circ$
20. Assertion: According to Euclid's axiom-“Things which are equal to the same thing are also equal to one another”. (1)  
 Reason: if  $AB = PQ$  and  $PQ = XY$ , then  $AB = XY$

#### SECTION - B

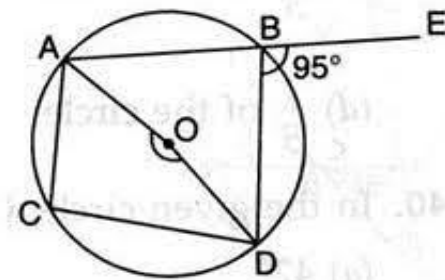
21. Using factor theorem factorise:  $p(x) = 2x^3 - 5x^2 - 19x + 42$ . (2)
22. Show that the angles of an equilateral triangle are  $60^\circ$  each. (2)

OR

In  $\triangle ABC$ , D is the midpoint of BC. If  $DL \perp AB$  and  $DM \perp AC$  such that  $DL = DM$ . Prove that  $AB = AC$ .



23. In the given figure, O is the centre of the circle, ABE is a straight line. If  $\angle DBE = 95^\circ$  then find the value of  $\angle AOD$ .

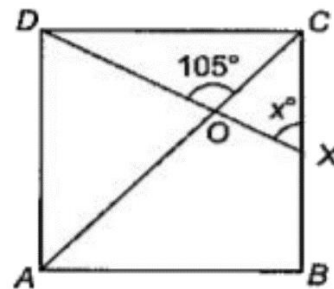


24. A traffic signal board, indicating “WORK IN PROGRESS”, is an equilateral triangle with side ‘a’. Find the area of the signal board, using Heron’s Formula. If its perimeter is 180cm. (2)

OR

The base of an isosceles triangle is 10 cm and one of its equal sides is 13 cm. Find its area using Heron’s Formula.

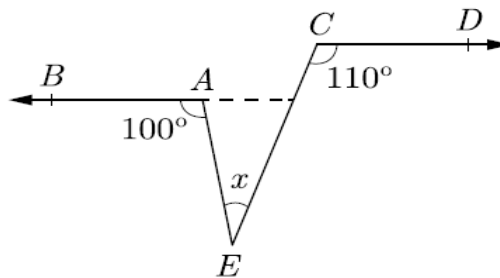
25. In the adjacent figure, ABCD is a square. A line segment DX cuts the side BC at X and the diagonal AC at O, such that  $\angle COD = 105^\circ$ . Find the value of x.



SECTION - C

26. Find the remainder, when  $3x^3 - 6x^2 + 3x - \frac{7}{9}$  is divided by  $3x - 4$ . (3)

27. In the given figure, find  $\angle x$ , if  $AB \parallel CD$  and  $\angle BAE = 100^\circ$ ,  $\angle ECD = 110^\circ$ . (3)



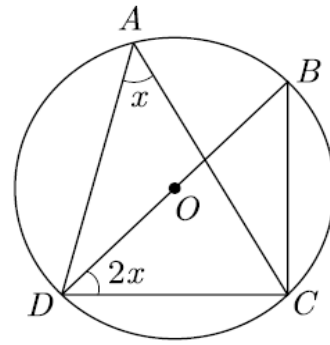
28. The points A (a, b) and B (b, 0) lie on the linear equation  $y = 8x + 3$ . (3)  
 (i) Find the value of a and b  
 (ii) Is (2, 0) a solution of  $y = 8x + 3$ ?  
 (iii) Write any two solutions of  $y = 8x + 3$ .

OR

Express y in terms of x, given that  $2x - 5y = 7$ . Check whether the points A(-3, -2) and B(1, -1), is on the given line.

29. In the given figure,  $O$  is the centre of the circle.  
Find the value of  $x$ .

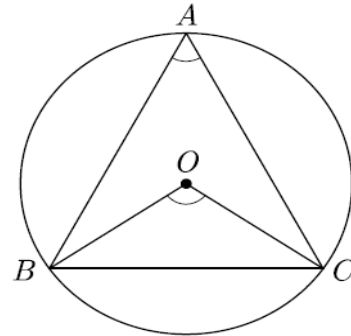
(3)



OR

Three PCOs (Public call offices) are situated at A, B and C as shown in the figure. These three booths are equidistant from each other.

- (i) Find  $\angle BAC$ .  
(ii) Find  $\angle BOC$

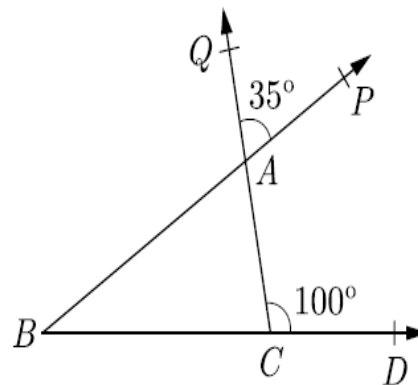


30. The polynomial  $p(x) = x^4 - 2x^3 + 3x^2 - ax + 3a - 7$  when divided by  $x + 1$ , leaves the remainder 19. Find the value of  $a$ . Also, find the remainder when  $p(x)$  is divided by  $x + 2$ .

(3)

31. Side BC, CA and BA of triangle ABC produced to D, Q, P respectively as shown in the figure. If  $\angle ACD = 100^\circ$  and  $\angle QAP = 35^\circ$ , find all the angles of a triangle.

(3)



SECTION - D

32. Express  $\sqrt{3}$  and  $\sqrt{5}$  both on the same number line.

(5)

OR

If  $a = \frac{1}{7-4\sqrt{3}}$  and  $b = \frac{1}{7+4\sqrt{3}}$ , find the values of the following:

- (i)  $a^2 + b^2$       (ii)  $a^3 + b^3$ .

33. A family with monthly income of ₹ 30,000 had planned the following expenditures per month under various heads:

(5)

Heads	Expenditure (in ₹ '000)
Rent	5
Grocery	4
Clothing	3
Education for children	5
Medicine	2
Entertainment	3
Miscellaneous	6
Saving	2

Draw a bar graph for the above data.

34. The sum of the height and radius of the base of a solid cylinder is 37 cm. If the total surface area of the cylinder is  $1628 \text{ cm}^2$ , then find its volume. (5)

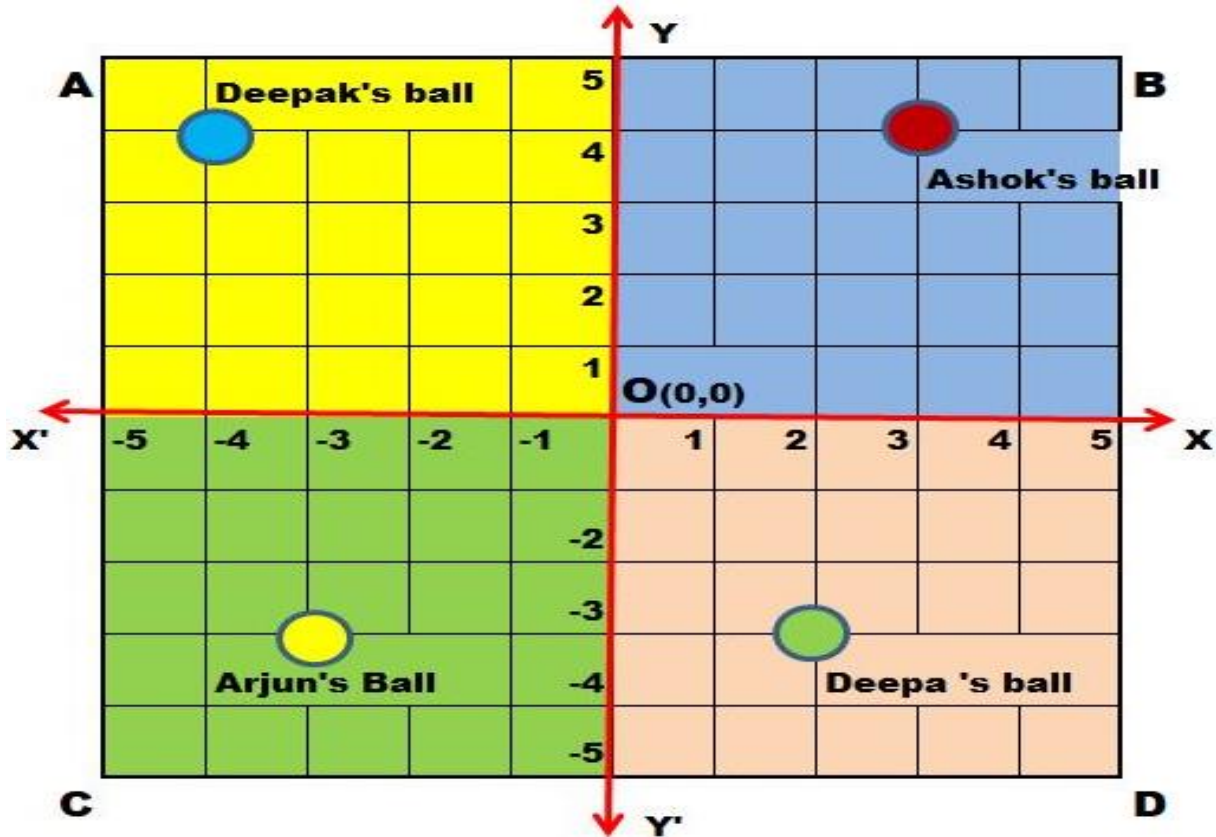
OR

The total cost of making a spherical ball is ₹ 33,957 at the rate of ₹ 7 per cubic metre. What will be the radius of this ball?

35. Draw the graph of linear equation  $x + 2y = 8$ . From the graph, check whether  $(-1, -2)$  is a solution of this equation. (5)

36.

SECTION -E



There is a square park ABCD in the middle of Safal colony in Karnavati. Four children Deepak, Ashok, Arjun and Deepa went to play with their balls. The colour of the ball of Ashok, Deepak, Arjun and Deepa are red, blue, yellow and green respectively. All four children roll their ball from centre point O in the direction of XOY, X'OY, X'OY' and XOY'. Their balls stopped as shown in the above image

- (i) Write the coordinates of the ball of Ashok. (1)  
(ii) What is the distance between Arjun's Ball and Deepa's Ball? (2)

OR

- (ii) Name the friends whose ordinate and abscissa are numerically same? (Ignore the +/- sign) (1)  
(iii) Whose ball is far from origin O? (1)

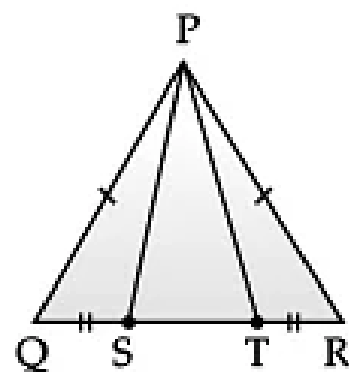
37. A children's park is in the shape of isosceles triangle say, PQR with  $PQ = PR$ , S and T are points of QR such that  $QT = RS$ .

- (i) Which rule is applied to prove that congruency of  $\Delta PQS$  and  $\Delta PRT$ ? (1)

- (ii) If  $\angle QPR = 80^\circ$ , find  $\angle PQR$ ? (2)

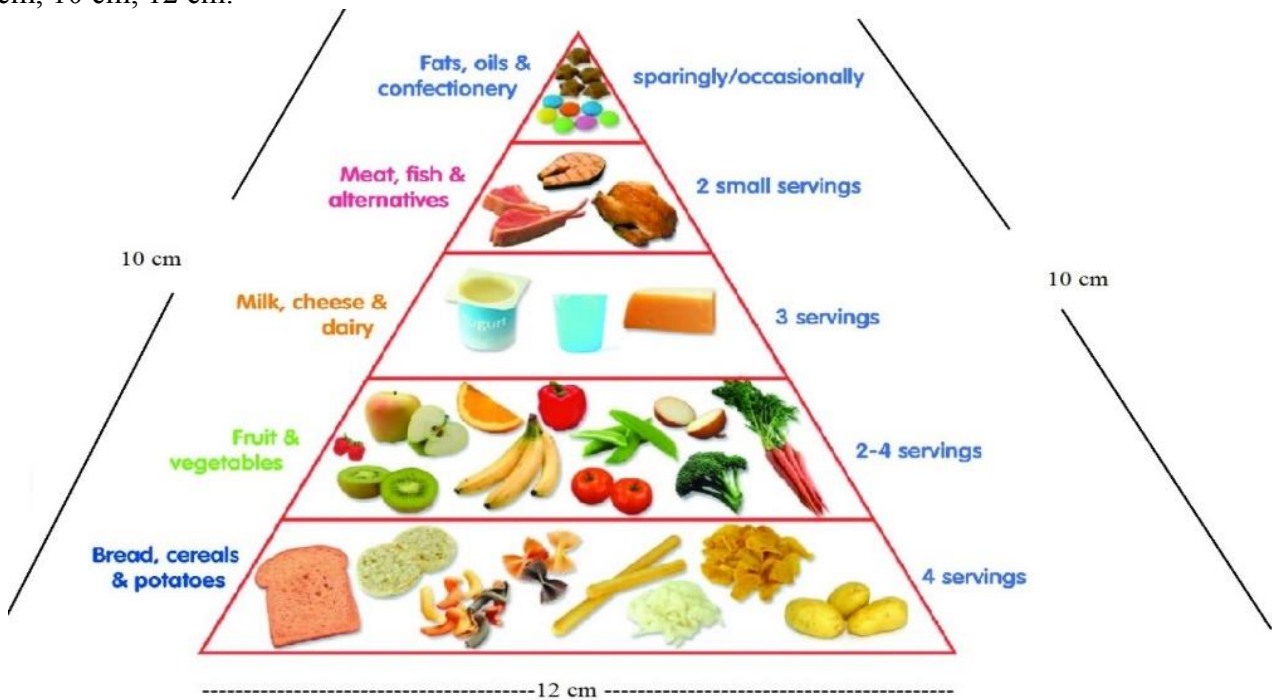
OR

- (ii) If  $PQ = 6 \text{ cm}$  and  $QR = 7 \text{ cm}$ , then find perimeter of  $\Delta PQR$ .



- (iii) Name the type of  $\Delta PST$ . (1)

38. A food pyramid is a representation of the optimal number of servings to be eaten each day from each of basic food groups. It is designed to make healthy eating easier. 'Health care India', an NGO in India working for underprivileged children. In rural areas health statistics are continue to remain poor. In this direction Health Care India has made, the children under the age of 13, aware of "food pyramid" by telling the importance of different food groups such as carbohydrates, fats, vitamins, proteins, minerals etc. The models of food pyramid which they have used is a triangle with sides 10 cm, 10 cm, 12 cm.



- (i) Which type of triangle is given in food pyramid? (1)
- (ii) Find the area of food pyramid which is in shape of triangle. (2)
- OR**
- (ii) Find the height of triangle. (1)
- (iii) What is the semi perimeter of the food triangle? (1)