PRACTICE QUESTION PAPER-I

CLASS-IX

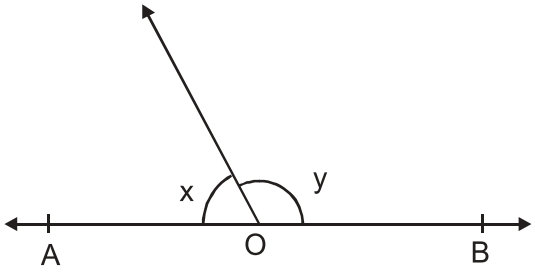
SUBJECT : MATHEMATICS

Time : 3 Hrs. **M.M. 80**

General Instruction:

1. All questions are compulsory.
2. The paper consists of 30 questions divided into four section A, B, C, D. Section A comprises of 6 questions of 1 mark each. Section B compmrises of 6 questions of 2 marks each. Section C comprises of 10 questions of 3 marks each. Section D comprises of 8 questions of 4 marks each.
3. There is no over all choice in this question paper. Although internal choices has been provided in some questions.

SECTION-A

1. Write the formula used to calculate the total surface area of a hemispherical solid of radius 'r'.
2. If each side of a trianagle is doubled then how many times the area of triangle increased?
3. 

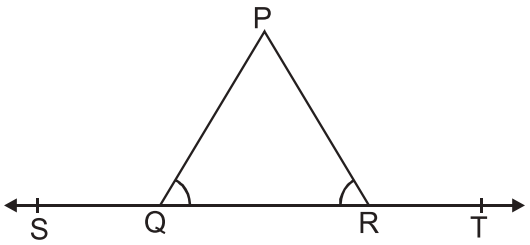
   If 2x = y then find the value of y?

4. Represent $\frac{-7}{5}$ on the number line.
5. In which quadrants y co-ordinates are negative?
6. How many solutions are there for equation y = x + 2?

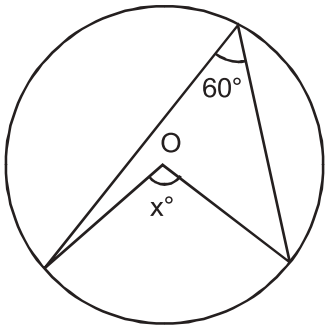
SECTION-B

7. Write the coefficients of x^2 in each of following.

(i) $2 - x^2 + x$ (ii) $\sqrt{2x} - 1$

8. 

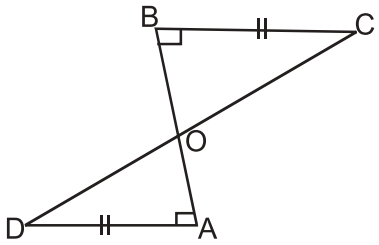
In figure $\angle PQR = \angle PRQ$ then prove that $\angle PQS = \angle PRT$.

9. 

Find the value of x°.

10. The angles of a quadrilateral are in the ratio 3 : 5 : 9 : 13. Find the greatest angle of the quadrilateral.

11. PQRS is a rhombus with $\angle QPS = 50°$ find $\angle RQS$.

12. 

AD and BC are equal perpendiculars to a line segment AB as given in figure, show that CD bisects AB.

SECTION-C

13. Simplify the given expression.

$(5+\sqrt{7})(2+\sqrt{5})$

14. Two coins are tossed simultaneously 500 times and we get

two heads = 105 times

one head = 275 times

No head = 120 times

find the probability of each of these events.

15. The following observations have been arranged in ascending order. If the median of the data is 63. Find the value of x.

29, 32, 48, 50, x, x + 2, 72, 78, 84, 95

OR

The points scored by a kabbadi team in a series of 10 matchers are as follows :

12, 17, 9, 13, 16, 9, 12, 13, 12, 17

Find the mean and mode of these score.

16. Evaluate $(998)^3$ using suitable identities.

17. Construct a triangle ABC in which BC = 8 cm, $\angle B = 45°$ and AB – AC = 3.5 cm.

OR

Construct a triangle ABC in which $\angle B = 60°$, $\angle C = 45°$ and AB + BC + AC = 11 cm.

18. If two lines intersect, prove that vertically opposite angles are equal.

OR

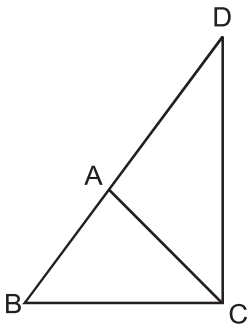
Prove that equal chords of a circle subtend equal angles at the centre.

19. Plot the point (x, y) given in the following table in the graph.

x	–3	6	–4
y	5	–4	–3

20. Give the geometric representation of $2x + 9 = 0$ as an equation.

(i) in one variable (ii) In two variable

21. 

ΔABC is an isosceles triangle in which AB = AC. Side BA is produced to D such that AD = AB. Show that $\angle BCD$ is a right angle.

OR

Prove that the angles opposite to equal sides of a triangle are equal.

22. Show that the area of an equilateral triangle is $\frac{\sqrt{3}}{4}x^2$ where x is side of the triangle.

SECTION-D

23. Show that the diagonals of a rhombus are perpendiccular to each other.

OR

Show that the bisectors of angles of a parallelogram form a rectangle.

24. Rationalise the denominator $\frac{1}{7+\sqrt{2}}$.

25. 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.

26. Given below is the data of students who participated in different activities.

Activity	Sports	Meditation	Yoga	Walking
Number of Girls	40	35	100	120

Draw the bar graph. For the given data.

27. Sides of a triangle are in ratio 12 : 17 : 25 and its perimeter is 540 cm. Find its area.

OR

A field is in the shape of a trapezium whose parallel sides are 25 m and 10 m, the non parallel sides are 14 m and 13 m find the area of the field.

28. If $x + y + z = 0$ show that,

$x^3 + y^3 + z^3 = 3xyz$

29. Draw the graph of following linear equation in two variables.

$x + y = 4$.

30. The length, breadth and height of a room are 5m, 4m and 3m respectively. Find the cost of white washing the walls of the room and the ceiling at the rate of ₹7.50 per m^2.

OR

The volume of a right circular cone is 9856 cm^3. If the diameter of the base is 28 cm find.

(i) Height of the cone.

(ii) Curved surface area of the cone.

SOLUTION

1. $3\pi r^2$

2. 3 times

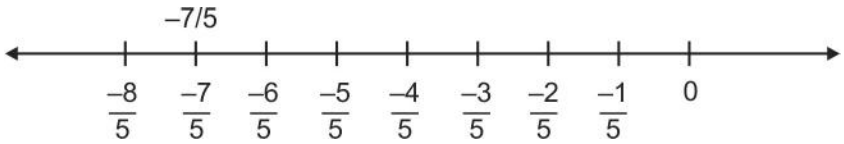
3. $2x = y$

   $x + y = 180°$

   $x + 2x = 180°$

   $x = 60$

   $\therefore \quad y = 120°$

4. 

5. III and IV Quadrants

6. Infinitely many solutions.

7. (i) –1, (ii) 0

8. $\angle PQR + \angle PQS = \angle PRQ + \angle PRT$ (Linear Pair)

   $\angle PQR + \angle PQS = \angle PQR + \angle PRT$ ($\because \quad \angle PQR = \angle PRQ$)

   $\therefore \quad \angle PQS = \angle PRT$

9. $x = 2 \times 60° = 120$

   (angle subtended by an arc at the centre is double the angle subtended by the same arc on the remaining part of the circle).

10. Let angles be 3x, 5x, 9x, 13x

    $\therefore \quad 3x + 5x + 9x + 13x = 360°$

    $30x = 360°$

    $\therefore \quad x = 12°$

    $\therefore$ Greatest angle = $13x = 13 \times 2 = 156$.

11. $\angle RQP + \angle QPS = 180°$

    $\therefore \quad \angle RQP = 180° - 50°$

    $\angle RQP = 130°$

    $\therefore \quad \angle RQS = 65°$

12. IN ΔOBC and ΔOAD

$\angle B = \angle A = 90°$ (given)

$BC = AD$ (given)

$\angle BOC = \angle AOD$ (V.O.A)

$\therefore$ $\Delta OBC \cong \Delta OAD$ (By AAS congruency rule)

$\therefore$ $OB = OA$ (CPCT)

$\therefore$ CD bisects AB.

13. $(5+\sqrt{7})(2+\sqrt{5}) = 10 + 5\sqrt{5} + 2\sqrt{7} + \sqrt{35}$

14. (i) P (2 Head) = $\frac{21}{100}$

(ii) P (One Head) = $\frac{11}{20}$

(iii) P (Not Head) = $\frac{6}{25}$

15. No. of terms (n) = 10 (even)

$\therefore$ $\text{Median} = \frac{\frac{n}{2}\text{th} + \left(\frac{n}{2}+1\right)\text{th term}}{2}$

$63 = \frac{5^{th}\text{term} + 6^{th}\text{ term}}{2}$

$\therefore$ $63 = \frac{x + x + 2}{2} \Rightarrow x = 62$

OR $\text{Mean} = \frac{130}{10} = 13$

Mode = 12

16. $(998)^3 = (1000 - 2)^3$

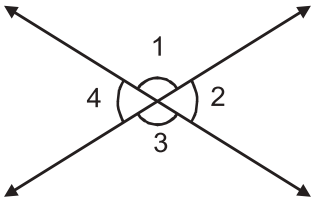
$(A - B)^3 = A^3 - B^3 - 3AB(A - B)$

$\therefore$ $(998)^3 = (1000)^3 - (2)^3 - 3 \times 1000 (1000 - 2)$

$= 1000012000 - 600008 = 994011992$

17. Construction of triangle.

18.



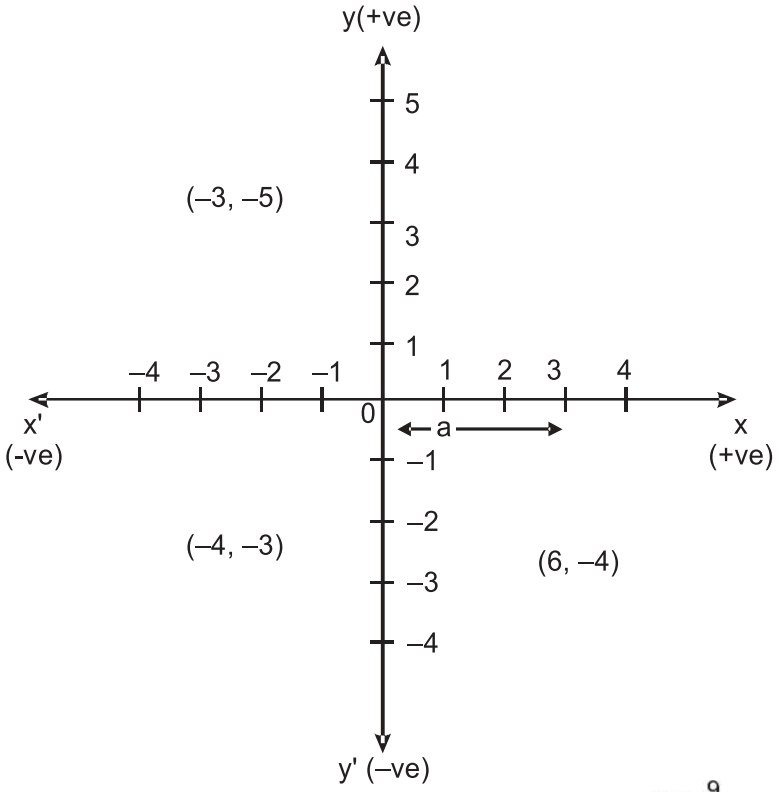
$\angle 1 + \angle 2 = \angle 1 + \angle 4$ (Linear Pair)

$\therefore \quad \angle 2 = \angle 4$

Similarly $\angle 1 = \angle 3$

$\therefore$ When two lines intersect, vertically opposite angles are equal.

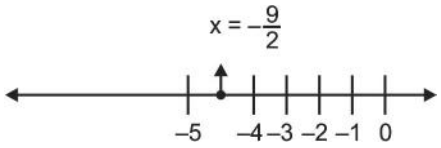
19.



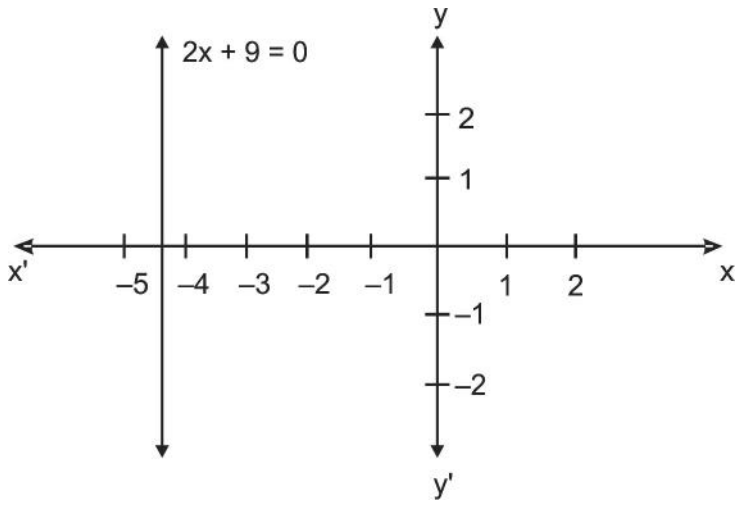
20. (i) In One Variable

$2x + 9 = 0$

$x = -\frac{9}{2}$



(ii) In Two Variable



21. In ΔBCD

$\angle B + \angle C + \angle D = 180°$ ($\angle$ sum prop.)

$\angle 1 + (\angle 2 + \angle 3) + \angle 4 = 180°$

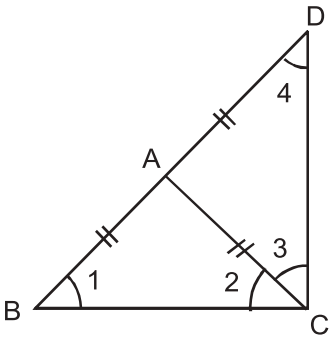
$\angle 2 + \angle 2 + \angle 3 + \angle 3 = 180°$ ($\therefore$ AB = AC)

$\therefore \quad 2(\angle 2 + \angle 3) = 180°$

$\angle 2 + \angle 3 = 90°$

$\therefore \quad \angle C = 90°$

i.e., $\angle BCD$ is a right angle.



OR

Draw AD $\perp$ BC

In rt ΔABC and rt ΔACD

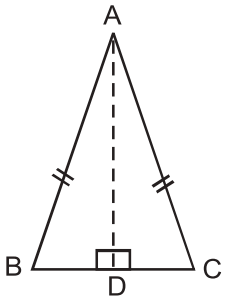
AB = AC (given)

AD = AD (Common)

$\angle ABD = \angle ADC (= 90°)$

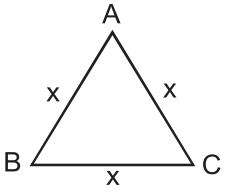
$\therefore \quad \Delta ABD \cong \Delta ACD$ (By RHS)

$\therefore \quad \angle B = \angle C$ (CPCT)



22. $S = \dfrac{x + x + x}{2} = \dfrac{3x}{2}$

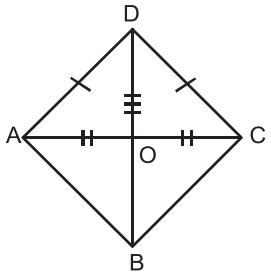
$\therefore \quad$ Area of $\Delta = \sqrt{s(s-a)(s-b)(s-c)}$



$$= \sqrt{\frac{3x}{2} \times \frac{x}{2} \times \frac{x}{2} \times \frac{x}{2}}$$

$$= \frac{\sqrt{3}}{4} x^2$$

23. In ΔAOD and ΔCOD



$OA = OC$ (diagonal of || gm)

$OD = OD$ (Common)

$AD = CD$ (Sides of rhombus)

$\therefore \quad \Delta AOD \cong \Delta COD$ (By SSS)

$\therefore \quad \angle AOD = \angle COD$ (CPCT)

$\angle AOD + \angle COD = 180°$ (Linear Pair)

$\therefore \angle AOD + \angle AOD = 180°$ $(\because \angle AOD = \angle COD)$

$\therefore \quad \angle AOD = 90°$

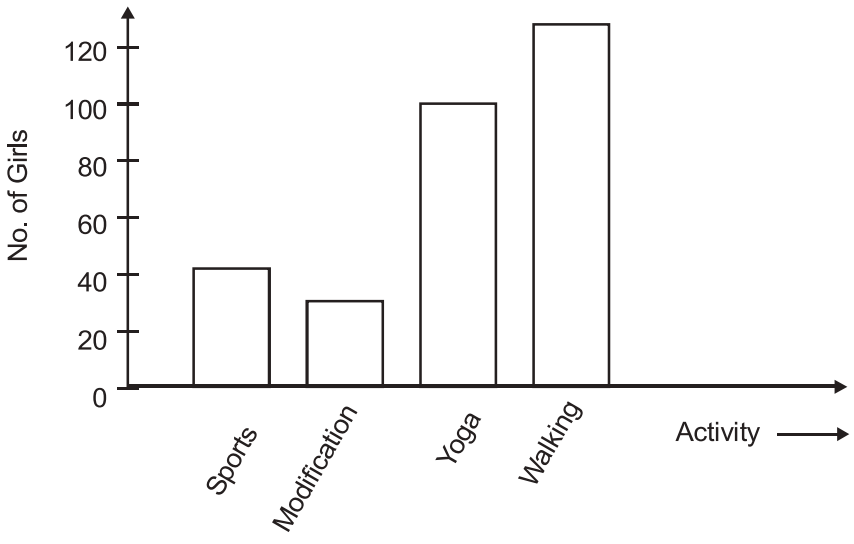
$\therefore$ Diagonals of rhombus are $\perp$ to each other.

24. $$\frac{1}{7+\sqrt{2}} = \frac{1}{7+\sqrt{2}} \times \frac{7+\sqrt{2}}{7-\sqrt{2}} = \frac{7-\sqrt{2}}{49-4}$$

$$= \frac{7}{47} - \frac{\sqrt{2}}{47}$$

25. Correct proof of theorem.

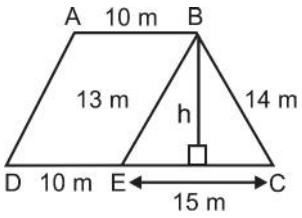
26.



27. Calcualtion of sides 120, 170 and 250 cm

$$\text{Area} = \sqrt{S(S-a)(S-b)(S-c)}$$

$$\text{Area} = 9000\ \text{cm}^2$$



OR

ar $\Delta BEC = 84\ \text{cm}^2$ (Hero's)

$$h = \frac{\text{Area} \times 2}{b} = 11.2\ \text{m}$$

$$\text{Area of trapezium} = \frac{1}{2} h\,[a + b] = 196\ \text{m}^2$$

28. Using identity $x^3 + y^3 + z^3 - 3xyz$

$$= (x + y + z)(x^2 + y^2 + z^2 - xy - yz - zx)$$

If $x + y + z = 0$

RHS $\Rightarrow$ $0 \times [x^2 + y^2 + z^2 - xy - yz - zx] = 0$

LHS $\Rightarrow$ $x^3 + y^3 + z^3 - 3xyz = 0$

Hence $x^3 + y3 + z^3 = 3xyz$

29. Correct graph for $x + y = 4$

30. Area of 4 walls = $2h\,[l + b] = 54\ \text{m}^2$

Area of ceiling = $L \times b = 20\ \text{m}^2$

Area to be white washed = $74\ \text{m}^2$

Cost = Area × Rate = ₹ 555

OR

$$\text{Volume} = \frac{1}{3}\pi r^2 h = 9856 = 12 \times \pi \times 14 \times 14 \times h$$

(i) $h = 48\ \text{m}$

(ii) CSA for cone = πrl

$$l = \sqrt{h^2 + r^2} = 50\ \text{cm}$$

CSA = $2200\ \text{cm}^2$