

**PRERNA EDUCATION**  
**CLASS-IX**  
**SUBJECT : MATHEMATICS**

Time : 3 Hrs.

M.M. 80

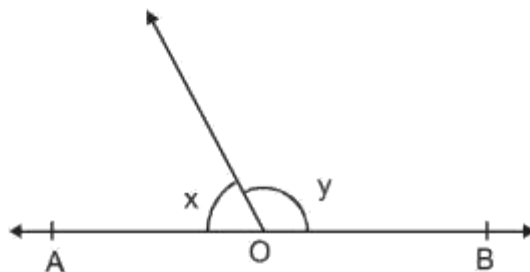
**General Instruction:**

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 comprises 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 triangle is doubled then how many times the area of triangle increased?

3.



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

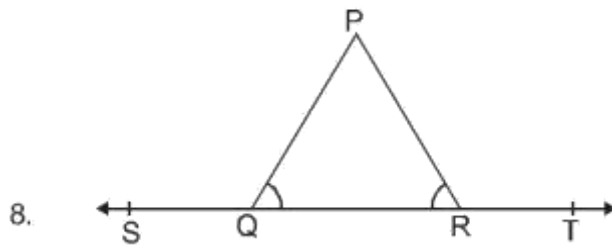
4. Represent  $\frac{-7}{5}$  on the number line.
5. In which quadrants y co-ordinates are negative?
6. How many solutions are there for equation  $y = x + 2$ ?

### SECTION-B

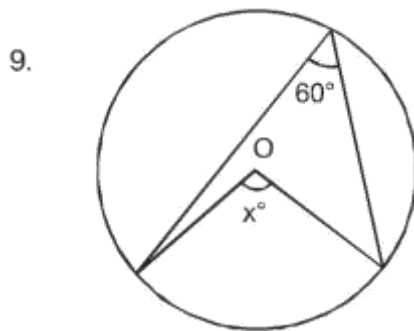
7. Write the coefficients of  $x^2$  in each of following.

(i)  $2 - x^2 + x$

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



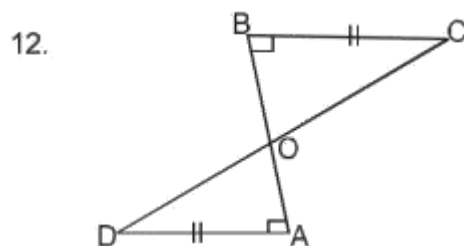
In figure  $\angle PQR = \angle PRQ$  then prove that  $\angle PQS = \angle PRT$ .



Find the value of  $x^\circ$ .

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  $\angle QPS = 50^\circ$  find  $\angle RQS$ .



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 matches 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,  $\angle B = 45^\circ$  and  $AB - AC = 3.5$  cm.

OR

Construct a triangle ABC in which  $\angle B = 60^\circ$ ,  $\angle C = 45^\circ$  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.

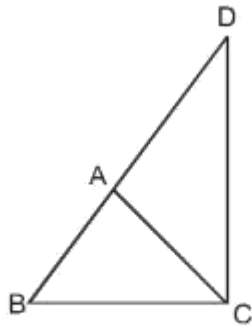
19. Plot the point (x, y) given in the following table in the graph.

|   |    |    |    |
|---|----|----|----|
| 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.



$\triangle ABC$  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 perpendicular 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  $9856 \text{ cm}^3$ . If the diameter of the base is 28 cm find.

- (i) Height of the cone.  
(ii) Curved surface area of the cone.