

Question Paper DPS (Session 2017-18)

Class- IX

Mathematics

Time- 3 Hours F.M. 80



DELHI PUBLIC SCHOOL, CHANDIGARH

Annual Examination (Session 2017-18)

Class-IX MATHEMATICS

1

SECTION - A

Question numbers 1 to 6 carry one mark.

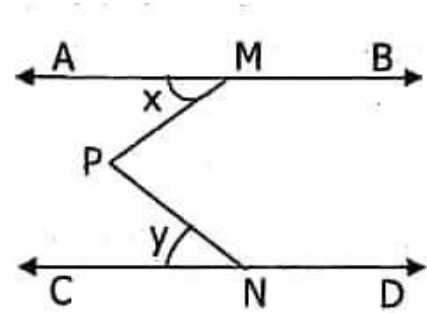
1. If $x^{\frac{1}{12}} = 49^{\frac{1}{24}}$ then find the value of x .
2. If $x^{31} + 31$ is divided by $x + 1$, then find the remainder.
3. In triangle ABC, if $\angle A - \angle B = 63^\circ$ and $\angle B - \angle C = 18^\circ$, then find $\angle B$.
4. Find the probability of not getting 3 or 4 in a single throw of a die.
5. The co-ordinates of points P and Q are $(-2, 3)$ and $(-5, 6)$ respectively. Find (abscissa of P) — (abscissa of Q).
6. If $2x - 4 = 5x + 7$, then find the value of x .

SECTION — B Question numbers 7 to 12 carry two marks each.

7. Does Euclid's fifth postulate imply the existence of parallel lines? Explain,
8. A card is drawn at random from a well shuffled deck of 52 cards. What is the probability of getting: a) a red coloured card b) a jack of black colour
9. If $a + b + c = 0$, then find the value of $\frac{a}{bc} + \frac{b}{ca} + \frac{c}{ac}$

10. A metallic sheet is rectangular in shape with dimensions 48cmx36cm. From each of its corners, a square of 8cm is cut off. An open box is made of the remaining sheet. Find the volume of the box.

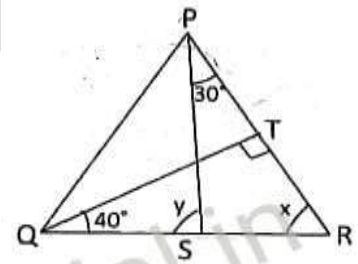
11. In the given figure, lines AB and CD are parallel and P is any point between the two lines. Prove that $\angle MPN = \angle x + \angle y$



12. Find the value of p, if (-1, 2) is the solution of the equation $4x + y = 3p$.

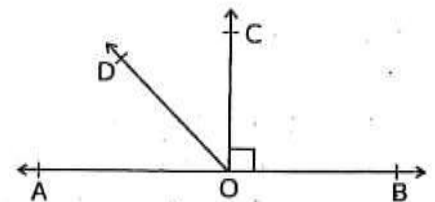
SECTION—C Question number 13 to 22 carry three marks each.

13. In the given figure, QT is perpendicular to line PR, $\angle TQR = 40^\circ$ and $\angle SPR = 30^\circ$, find the value of x and y.



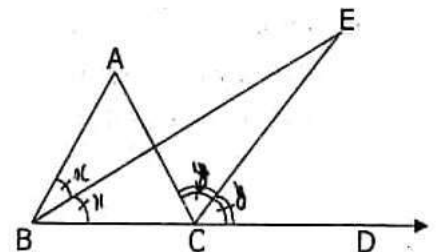
14. Represent $\sqrt{6.3}$ on the number line.

15. In the given figure, AOB is a line. Ray OC perpendicular to line AB. OD is another ray lying between rays OA and OC. Prove that $\angle COD = \frac{1}{2}(\angle BOD - \angle AOD)$.



OR, In triangle ABC, the internal bisector of $\angle B$ and the external bisector of exterior $\angle ACD$ meet at E.

Prove that $\angle BEC = \frac{1}{2} \angle BAC$



16. Find the co-ordinates of the vertices of a rectangle whose length is 5 units and breadth is 3 units. If one of the vertex is origin, longer side is on the x- axis and one vertex lies in the 3rd quadrant

17. A rhombus has perimeter 100m and one of its diagonal is 40m. Find the area of the rhombus.

OR , The sides of a triangular field are 41m, 40m and 9m. Find the number of rose beds that can be prepared in the field, If each rose bed on an average needs 900 cm^2 space.

18. Find the mean of the given data:

Number of vehicles	0	1	2	3	4	5
Number of families	5	11	25	12	5	2

OR

The mean of 200 items was 50. Later on, it was discovered that the two items were misread as 92 and 8 instead of 192 and 88. Find the correct mean

19. Draw the graph of the equations $x - y = 1$ and $2x + y = 8$. Find the coordinates of the point of Intersection of two lines on the graph.

20. Prove that the equal chords of congruent circles subtend equal angles at the centre.

21. Show that if the diagonals of a quadrilateral bisect each other at right angles then it is a rhombus.

OR

Show that the quadrilateral formed by joining the mid points of the consecutive sides of a rectangle is a rhombus.

22. Diagonals AC and BD of quadrilateral ABCD intersect at O in such a way that $\text{ar}(\triangle AOD) = \text{ar}(\triangle BOC)$ Prove that ABCD is a trapezium.

SECTION—D Question numbers 23 to 30 carry four marks each.

23. Simplify: $\frac{5-\sqrt{3}}{2+\sqrt{3}} = x + y\sqrt{3}$. Find the values of x and y

OR If $x = \frac{1}{2-\sqrt{3}}$, find the value of $x^3 - 2x^2 - 7x + 5$

24. The volume of metallic cylindrical pipe is 748cm^3 . Its length is 14cm and its external radius is 9cm. Find its thickness.

OR, Each edge of a cube is increased by 50%. Find the percentage increase in the surface area of the cube.

25. Construct a triangle ABC in which $BC = 7\text{cm}$, $\angle ABC = 60^\circ$ and $AB + AC = 12\text{cm}$.

26. Quality ice cream is available in conical, cylindrical and spherical shape. The radius of the base of the cone and cylinder are equal to the radius of the sphere which is 3cm. The height of the cylinder is 4cm and that of cone is 12cm. Which has more quantity of ice cream? Eating too much ice cream is harmful according to dentists. How will you discourage it

27. Factorise: $2a^2 + b^2 + 8c^2 - 2\sqrt{2}ab + 4\sqrt{2}bc - 8ac$.

OR Factorise: $(a + b + c)^2 - (a - b - c)^2 + 4b^2 - 4c^2$.

28. If $(x + 1)$ and $(x - 1)$ are factors of $ax^3 + x^2 - 2x + b$, then find the values of a and b.

29. Prove that the line segment joining the mid points of the two sides of a triangle is parallel to the third side and half of it.

30. Draw a histogram for the following data:

Marks	5-15	15-20	20-25	25-30	30-40	40-60	60-80
Students	12	6	7	8	16	8	12