



Creating Excellence

Std:10 CBSE

Sub: Maths

Marks: 90

SECTION - A

Question numbers 1 to 4 carry 1 mark each.

1. What is the common difference of an A.P. on which $a_{23} - a_{18} = 45$?
2. If the steel wire tied to the top of the tower makes an angle of 60° with the ground. Then find the length of the wire, given height of the tower is 12 m.
3. What is the distance of the point $(-6, 7)$ from the y -axis ?
4. What is the probability of having 53 Mondays in a leap year ?

SECTION - B

Question numbers 5 to 10 carry 2 marks each.

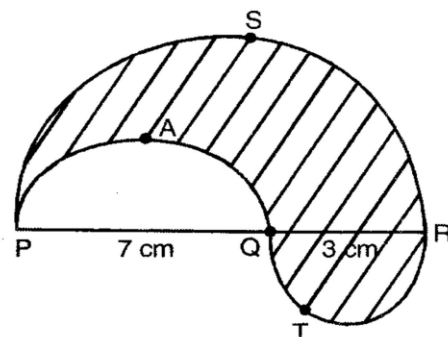
5. Find two consecutive positive integers, sum of whose square is 365.
6. Write first four terms of the A.P. whose first term is 10 and common difference is 10.
7. Draw a circle of radius 3.5 cm. Take any point P on its circumference and draw a tangent to the circle.
8. The circumference of two circles are in the ratio 2 : 3. Find the ratio of the areas.
9. The length of tangent from a point A at distance 5 cm from the centre of the circle is 4 cm. Find the radius of the circle.
10. Divide a line segment of 7 cm internally in the ratio 1 : 2.

SECTION - C

Question numbers 11 to 20 carry 3 marks each.

11. Find the roots of the quadratic equation $\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30}$, $x \neq -4, 7$
12. Find the sum of all two digit numbers which when divided by 3 yield 1 as remainder.
13. Prove that a parallelogram circumscribing a circle is a rhombus.
14. From a point on the ground, the angles of elevation of the bottom and top of transmission tower fixed at the top of a 20 m high building are 45° and 60° respectively. Find the height of the tower.
15. If the point $P(x, y)$ is equidistant from the points $A(a - b, a + b)$ and $B(a + b, b - a)$, then prove that $bx = ay$.
16. A die is thrown once. Find the probability of getting :
 - (i) a number lying between 2 and 6
 - (ii) an odd number.
17. A farmer connects a pipe of internal diameter 20 cm from a canal into a cylindrical tank in her field, which is 10 m in diameter and 2 m deep. If water flows through the pipe at the rate of 3 km/h, in how much time will the tank be filled ?
18. If the coordinates of the points P and Q are (2, 5) and (8, 6) respectively, find the coordinates of L such that $\frac{PL}{LQ} = \frac{2}{5}$.
19. A well of diameter 2 m is dug 14 m deep. The earth taken out of it, is spread evenly all around it to a width of 5 m to form an embankment. Find the height of the embankment.

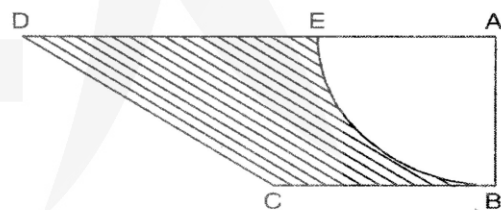
20. In the given figure ; PSR, RTQ and PAQ are three semicircles of diameters 10 cm, 3 cm and 7 cm respectively. Find the perimeter of the shaded region. [Use $\pi = 3.14$]



SECTION - D

Question numbers 21 to 31 carry 4 marks each.

21. The angles of elevation and depression of the top and the bottom of a tower from the top of a building, 60 m high, are 30° and 60° respectively. Find the difference between the heights of the building and the tower and the distance between them.
22. A bag contains 18 balls out of which x balls are red.
 (i) If one ball is drawn at random from the bag, what is the probability that it is red ?
 (ii) If 2 more red balls are put in the bag, the probability of drawing a red ball will be $\frac{9}{8}$ times than that in part (i). Find x .
23. Find the area of the triangle formed by joining the mid-points of the sides of the triangle whose vertices are $(0, -1)$, $(2, 1)$ and $(0, 3)$. Find the ratio of this area to the area of the given triangle.
24. Prove that the opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.
25. Let ABC be a right triangle in which $AB = 6$ cm, $BC = 8$ cm and $\angle B = 90^\circ$. BD is the perpendicular from B on AC. The circle through B, C, D is drawn. Construct the tangents from A to this circle.
26. In the given figure, ABCD is a trapezium of area 24.5 sq.cm. In it, $AD \parallel BC$, $\angle DAB = 90^\circ$, $AD = 10$ cm and $BC = 4$ cm. If ABE is a quadrant of a circle, find the area of the shaded region.



[Take $\pi = \frac{22}{7}$]

27. Solve for x by using quadratic equation : $a^2b^2x^2 + b^2x - a^2x - 1 = 0$.
28. Find the sum of : $7 + 10\frac{1}{2} + 14 + \dots + 84$.
29. A solid wooden toy is in the form of a cone mounted on a hemisphere. If the radii of the hemisphere and the base of the cone are 4.2 cm each and the total height of the toy is 10.2 cm, find the volume of wood used in the toy. Also, find its total area.
30. In a high school, students thought of planting trees. It was decided that the number of trees that each section of each class will plant be the same as the class they are studying i.e., a section of class I will plant 1 tree, a section of class II will plant 2 trees and so on, a section of senior most class X plant 10 trees. There are three sections of each class.
 (i) How many trees will be planted by the students ?
 (ii) Write the importance of trees.
31. A container open at the top, is in the form of a frustum of a cone of height 24 cm with radii of its lower and upper circular ends as 8 cm and 20 cm respectively. Find the cost of milk which can completely fill the container at the rate of ₹ 21 per litre.

[Use $\pi = \frac{22}{7}$]