

CLASS X SAMPLE PAPER MATHEMATICS

Time: 3hrs

Max. Marks: 90

Section-A

1. First term of an A.P. is -3, Common Difference is 5, Find an expression for its n^{th} term.
2. Find the midpoint of the line joining points (4,-6) and (5, 3).
3. What is the probability of getting 5 Sundays in February of a non-leap year.
4. A cylinder of height 3 cm is melted and recast into a cone of same base as cylinder. What is the height of the cone?

Section-B

5. An A.P consists of 'n' terms with first term 'a' and last term 'l' Show that the sum of its p^{th} term from the beginning and p^{th} term from the end is $(a + l)$.
6. For what value of 'k', the equation $5kx^2 + 2kx + 1 = 0$ is a perfect square.
7. Draw a circle of radius 2.5 cm and draw a tangent to it from a point on the circle without using the centre.
8. Three circles touch each other externally. Radii of two circles are 2 cm and 3 cm and the perimeter of the triangle joining the centres is 18 cm, find the radius of the third circle.
9. Three horses are tied to the corners of a triangle with a rope of 7 m long, find the area grazed.
10. Area of 60° sector of a circle is 18 cm^2 . Find the area of the corresponding minor segment. ($\sqrt{3} = 1.73$)

Section-C

11. PA is a tangent to a circle with centre 'O' and radius 5 cm. AD is a chord of length 6 cm intersecting OP at C. Find the length of PA.
12. A circle is inscribed in a right triangle whose sides making right angle are 3.5 cm and 12 cm, find the radius of the circle.

13. A circle of radius 2 cm inscribed in a triangle divides one of the sides at the point of contact into two segments of 5 cm and 4 cm. Find the length of the other two sides of the triangle.
14. First term an A. P. is 'a', second term is 'b' and last term is 'p'. Show that sum of its terms is $\frac{(a+p)(p+b-2a)}{2(b-a)}$.
15. Two resistors when connected in series give a total resistance of 25Ω , but when connected in parallel the resistance goes down to 6Ω . Find the resistance of each resistor.
16. A bag contains 6 Blue balls, 9 Green balls, 8 Red balls and 7 white balls. One ball is drawn at random. What is the probability that the drawn ball is (i) Green, (ii) Not blue (iii) either Red or White ball?
17. If P (x, y) is a point on the line joining (a,0) and (0,b) then show that $\frac{x}{a} + \frac{y}{b} = 1$
18. Show that the points (-2, 1), (0,-2), (6, 2) and (4, 5) are vertices of a rectangle.
19. A solid sphere is cut into two hemispheres. Find the percent of increase in the surface area.
20. A right triangle whose sides making right angle is inscribed in a circle. Find the area of the circle not included in the triangle. ($\pi = 3.14$)

Section-D

21. If (3, 4) and (-2, 3) are two vertices of an equilateral triangle, find the third vertex.
22. All kings are removed from a well shuffled pack of cards. One card is drawn at random. What is the probability that the drawn card is (i) a face card (ii) an ace (iii) a red card (iv) a card of clubs?
23. A man standing on the deck of a boat 20m above the water level observes angle of elevation of a cloud to be 45° and the angle of depression of its reflection in water to be 60° . Find the height of the cloud.
24. Angles of elevation of the top of a tower from two points-200 m apart- on the ground were found to be 30° and 60° . Find the height of the tower. ($\sqrt{3} = 1.73$)
25. PT is a tangent to a circle with centre 'O' and PAB is a secant intersecting the circle at A & B. Prove that $PT^2 = PA \cdot PB$
26. Sum of 'n' terms of an A.P. is given by $\frac{5n^2+1}{2}$. Find the A.P. and sum of its 20 terms.

27. A man bought certain length of cloth- to give a charity- spending Rs. 300. Had the rate per meter been Rs. 3 less he would have got 5 m more for the same amount. Find the length of the cloth and rate per meter. What is the value is reflected?
28. An express train takes 25 minutes less to cover a distance of 300 km than a passenger train. If the speed of the express train is 10 km/h more than the passenger train, find the speeds of the trains.
29. Height of a cone is trisected by two planes parallel to the base. Show that the volumes of the solids so formed are in the ratio 1 : 17 : 19.
30. An open bucket in the form of frustum of a bucket has radii of top and bottom 30 cm and 21 cm respectively and is 40 cm high. Find its capacity and area of the sheet used to make the bucket. ($\pi = 3.14$).
31. A circus tent is cylindrical up to a height of 3.5 m and conical above it. If the slant height of the conical part is 42 m and diameter of the base is 56 m find the area of the canvas used to make the tent and the cost at Rs.25/m, if the width of the canvas is 5 m.