

CLASS X SAMPLE PAPER MATHEMATICS

Section A

1. What is the ratio of the TSA of a solid hemisphere to the square of the radius.
2. Which term of the A.P. 84, 80, 76, 72..... will be the 1st negative term?
3. If the points (0,0), (1,2) & (x,y) are collinear, Find the relationship between x & y.
4. $(x^2 + y^2)(a^2 + b^2) = (ax + by)^2$. Prove that $\frac{x}{a} = \frac{y}{b}$.

Section B

5. Find the ratio of in which the point P $\left(\frac{3}{4}, \frac{5}{12}\right)$ divides the line segment joining the point A $\left(\frac{1}{2}, \frac{3}{12}\right)$ & B (2, -5).
6. Perimeter of the protractor is 72 cm, Calculate the area.
7. The common difference of an A.P. is -2. Find the sum, if the 1st term is 100 & the last term is -10.
8. 3 Prove that nth term of the A.P. can not be n^2+2 . Justify.
9. Solve for x : $\frac{2}{x+1} + \frac{3}{2(x-2)} = \frac{23}{5x}$
10. Two dice are thrown. Find the following probabilities: (i) Sum of the two numbers appearing on the top of the dice is 9. (ii) Numbers appearing on the dice are same (iii)

Section C

11. If $x=-4$ is a root of the equation $x^2 + 2x + 4p = 0$, find the values of 'k' for which the equation $x^2 + px(1 + 3k) + 7(3 + 2k) = 0$ has equal roots.

12. PA & PB are tangents drawn to a circle with centre O. such that $\angle BPA=120^\circ$. Prove that $OP=2PB$.
13. A bag contains 20 balls out of which 'x' balls are red. (i) If one ball is drawn at random from the bag, find the probability that it is not red. (ii) If 4 more red balls are put into the bag, the probability of drawing a red ball will be $\frac{5}{4}$ times the probability of drawing a red ball in the first case. Find the value of 'x'.
14. A circle touches BC of $\triangle ABC$ at P & also touches the sides AB & AC produced at Q & R respectively. Prove that $AQ = \frac{1}{2}$ (Perimeter of $\triangle ABC$).
15. Find the roots: $\frac{a}{x-b} + \frac{b}{x-a} = 2$
16. Draw a right triangle in which sides are of lengths 4 cm & 3 cm. Then construct another triangle whose sides are $\frac{5}{3}$ times of the corresponding sides of the given triangle.
17. ABCD is rectangle of 20cm x 10 cm. A semi-circle is drawn with centre O. radius $OL=OM = 10\sqrt{2}$ cm. & it passes through A & B. Find the area of the shaded region.
18. (i) A numbers x is chosen from the numbers -4, -3, -2, -1, 0, 1, 2, 3, 4. Find the probability that $|x| < 3$.

(ii) At a fete, cards bearing numbers 1 to 1000, one number on one card, are put in a box. Each player select one card at random & that card is not replaced. If the selected card has a perfect square greater than 500, the player wins a prize. What is the probability that (i) the first player wins a prize? (ii) the second player wins a prize, if the first has won?

19. Solve for 'x': $\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}$
20. The sum of the third and the seventh terms of an AP is 6 and their product is 8. Find the sum of first sixteen terms of the AP.

Section C

21. The cost of planting the grass in a circular park @ Rs. 5 per m^2 is Rs. 27720. A path of uniform width runs around the park. The cost of gravelling the path @ Rs. 3.50 per m^2 . Is Rs. 10780. Find the cost of fencing the path on both sides @ Rs. 3 per m.
22. A vessel full of water is in the form of an inverted cone of height 8 cm & the radius of its top, which is open, is 5cm. 100 spheres are dropped into the vessel. One fourth of the water flows out of the vessel. Find the radius of the spherical ball.
23. X & Y are centres of circles of radius 9cm & 2cm & $XY=17$ cm. Z is the centre of a circle of radius 'r' cm, Which touches the above circles externally. Given that $\angle XZY = 90^\circ$, Write the equation in 'r' & solve it for 'r'
24. If the roots of the equation $(c^2 - ab)x^2 - 2(a^2 - bc)x + b^2 - ac = 0$ are equal. Prove that either $a=0$ & $a^3 + b^3 + c^3 = 3abc$

25. A cone is cut by a plane parallel to the base & the upper part is removed. If the curved surface area of the remainder is $15/16$ of the curved surface area of the whole cone, Find the ratio in which height is divided by the plane.
26. The angle of elevation of the jet fighter from a point A on the ground is 60° . After flying for 10 seconds, the angle changes to 30° . If the jet is flying at a speed of 648 km/hr, Find the constant height at which jet plane is flying
27. One fourth of the herd of camels was seen in the forest. Twice the square root of the herd had gone to the mountain & remaining 15 are seen on the bank of the river. Find the total number of camels.
28. A right circular cone is divided by a plane parallel to the base into small cone of volume V_1 at the end a frustum of volume V_2 as second part at the bottom. If $V_1 : V_2 = 1 : 3$, find the ratio of the height of the altitude of small cone & that of the frustum.
29. If the angle of elevation of a cloud from a point 'h' metres above a lake is α & the angle of depression of its reflection in the lake is β , Prove that the distance of the cloud from the point of observation is $\frac{2h \sec \alpha}{\tan \beta - \tan \alpha}$
30. If the sum of first m-terms of the A.P. is same as the sum of first n-terms, Find the sum of (m+n) terms
31. PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q intersect at a point T. Find the length TP.

For problems relating to this paper mail to

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only upto session 2015-16.