10th Maths Sample Paper-8 (CBSE SA2 Board Exam 2018)

Time Allowed: 3 Hours   Max. Marks: 80

SECTION A

1. If α and β are the zeros of the quadratic polynomial $p(x) = x^2 — k(x + 1) — a$ and if $(α + 1)(β + 1) = 0$, find a.

2. What is the distance between two parallel tangents of a circle of radius 14 cm?

3. Find the distance between the points (a cos 45°, 0) and (0, a cos 45°).

4. The following are the marks of 9 students in a class: Find the median of these marks.

19, 26, 29, 28, 31, 35, 36, 37, 48

5. A number x is chosen from the numbers $— 5, — 4, — 3, — 2, — 1, 0, 1, 2, 3, 4, 5$. What is the probability that $| x | < 4$?

6. In the given figure, the area of shaded region between two concentric circles is 264 cm². The sum of radii of two circles is 14 cm. Find the difference of their radii.
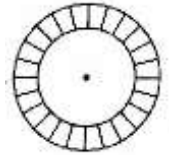
SECTION B

7. Use Euclid's division algorithm to find whether the pair of numbers 847 and 2160 are co-prime or not.

8. In an AP, the sum of n terms is $\frac{1}{2}(5n^2 + 3n)$. Find its 40th term.

9. The points (p, q), (m, n) and (p - m, q - n) are collinear. Prove that pn = qm.

10. If cos A - sin A = 1, prove that cos A + sin A = ± 1.

11. Convert the following distribution to a more than type cumulative frequency distribution:

Marks obtained	0 - 20	20 — 40	40 — 60	60 — 80	80 — 100
Number of students	5	9	12	8	6

12. The total surface area of a solid hemisphere is 462 cm². Find its volume.

SECTION C.

13. If α and β are the zeros of the quadratic polynomial $x^2 − (p + 6)x + 2(2p − 1)$ and if α + β = ½ αβ, find p.

14. The equation $5x^2 + (9 + 4k)x + 2k^2 = 0$ and 5x + 9 = 0 are satisfied by the same value of x. find the values of k.

15. An AP consists of 21 terms. The sum of the three terms in the middle is 63 and sum of last three terms is 90. Find the AP.

16. In an equilateral triangle ABC, the side BC is trisected at P. Prove that $9AP^2 = 7AB^2$

17. Draw an isosceles triangle PQR in which PQ = PR = 6 cm and QR = 5 cm. Construct a triangle ABC similar to ΔPQR in which AB = 8 cm. Give the justification of the construction.

18. Find the vertices of the triangle, if (12, 5), (8, 4) and (7, 8) are mid-points of the sides of the triangle.

19. If cosec θ + cot θ = m, show that $\frac{m^2 - 1}{m^2 + 1}$ = cos θ.

20. In the given figure, find the area of the shaded region, where OA = OB = OC = OD = 14 cm.
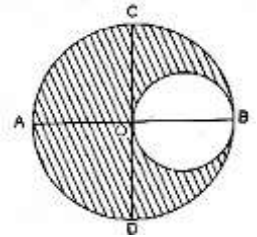
21. Solve for x: {4/3(sec²69° - cot²21°)} – (2/3 sin 90°) + (3 tan²64° /cot²26°)

22. The medical check-up of 40 people wearing spectacles in different age groups give rise to the following distribution:

Age(yrs)	38 - 40	40 - 42	42 - 44	44 - 46	46 - 48	48 - 50	50 - 52	52 - 54	54 - 56
People	2	3	4	5	14	3	4	2	3

Draw both ogives for the given data. Hence, obtain the median age from the graph.

SECTION D

23. Show that any positive odd integer is of the form 4q + 1 or 4q + 3, where q is some positive integer.

24. Solve for x and y: mx + ny = m + n and $m \left(\frac{1}{m-n} - \frac{1}{m+n} \right) x$ + n$\left(\frac{1}{n-m} - \frac{1}{m+n} \right) y = \frac{2m}{m+n}$

OR, Solve for x and y : mx - ny = m + n and x - y = 2n

25. If the polynomial x⁴ — 6x³ + 16x² — 25x + 10 is divided by another polynomial (x² — 2x + k), the remainder comes out to be (x + a), find k and a.

26. Prove that the equilateral triangle described on the two sides of a right-angled triangle are together equal to the equilateral triangle on the hypotenuse in terms of their areas.
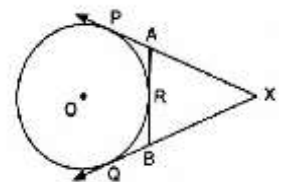
27. In the given figure, XP and XQ are two tangents to a circle with centre 0 from a point X outside the circle. ARB is tangent to circle at R. Prove that XA + AR = XB + BR.

28. Jagdeep, a fireman while throwing water on a fire of a burning house, noticed a woman in the first floor crying for help. The first floor is at height of 20 m above the ground. Jagdeep fix the staircase in such a way that one end of staircase touches the top of first floor and other end makes an angle of 30° with ground. Jagdeep goes to first floor by staircase and saves the woman. Calculate the distance travelled by Jagdeep and what value is depicted by saving woman's life?

29. A card game has 15 squares of which 5 are blue and 10 are red, 8 triangles of which 5 are green and 3 are blue and 12 rhombuses of which 7 are red and 5 are green. One piece is lost at random find the probability that it is a

(i) square (ii) triangle of green colour (iii) rhombus of red colour (iv) rhombus.

30. The barrel of fountain pen, cylindrical in sh ape, is 7 cm iong and 2.5 mm in radius. A full barrel of ink in the pen is used up for writing 440 words on an average. How many words would use up a bottle of ink containing 200 cm³?

*RSPL/EAD/Mock Paper 8 Shared by visitors 2018