10th Maths Sample Paper-9 (CBSE SA2 Board Exam 2018)

Time Allowed: 3 Hours Max. Marks: 80

SECTION A

1. If sin A – cos A = 0. Find value of A.

2. Find the value of K so that the sum of the roots of quadratic equation $3x^2 + (2k+1)x – (k+5) = 0$ is equal to the product of roots

3. If the class marks of a continuous frequency distribution are 1400, 1500, 1600, 1700. Then find the class intervals corresponding to the class marks .1400 and 1800.

4. If sum of the first n term of AP = $4n^2 – 3n$. Find the value of nth term of an AP.

5. Find the perimeter of the sector of radius 10.5 cm with sector angle of 60 deg.

6. Find the ratio in which the line segment joining A (3, 4) and B (-2, 1) is divided by the y-axis

SECTION B

7. Find the value of : $(-1)^n + (-1)^{2n} + (-1)^{2n+1} + (-1)^{4n-2}$, where n is any positive odd integer.

8. Simplify: (1 — sin A) (tan A + sec A)

9. Which term of the A.P: 120, 116, 112, ….. is its first negative term.

10. If the perimeter of a protractor is 72 cm, calculate its area.

11. Find the roots of the equation $ax^2 + a = a^2x + x$

Or, Solve for x : $4\sqrt{3}\,x^2 + 5x - 2\sqrt{3} = 0$

12. 7. ABC is an isosceles triangle such that AB = AC. D is the midpoint of AC, A circle is drawn taking BD as diameter which intersects AB at the point E. Prove that AE = ¼ AC

SECTION C.

13. show that cube of any positive integer is of form $4m, 4m + 1, 4m + 3$ for some integer m

14. Check whether polynomial $3x^2$— 5x+ 2 is a factor of the polynomial $3x^4 – 5x^3 – 10x^2$+ 20x – 8. Verify by division algorithm

15. Solve the following pair of equations: 49x +51y =499 and 51x + 49y = 501

16. If a cosec A = p and b cot A= q, then prove that $\frac{p^2}{a^2} - \frac{q^2}{b^2} = 1$

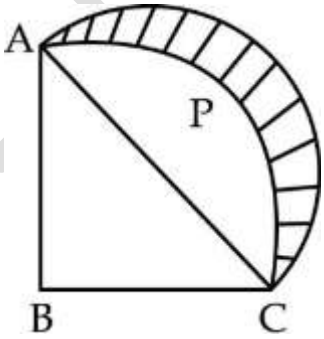
16. In a study on asthmatic patients, the following frequency distribution was obtained. Find the average (mean) age at the detection.

Age at detection (in years)	0-9	10-19	20-29	30-39	40-49
Number of patients.	12	25	13	10	5

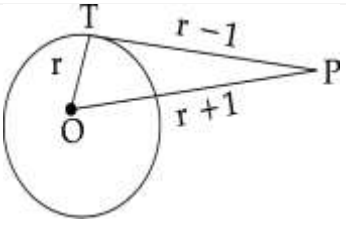
17. Prove that the intercept of a tangent between a pair of parallel tangents to a circle subtend a right angle at the centre of the circle.

18. One card is drawn from a well shuffled pack of 52 cards. Calculate the probability of getting (i) A king or a queen (ii) Neither a heart nor a red king

19. ABCP is a quadrant of a circle of radius 14 cm. With AC as diameter a semicircle is drawn. Find the area of the shaded region [use π = 22/7)]



20. In the figure, PT is the tangent to the circle having centre O. If $PT = r - 1,\ OT = r$ and $OP = r + 1$, find the actual lengths of the sides of the $\triangle$OPT.



21. The angle of elevation of the top of a hill from the foot of a tower is 60° and the angle of elevation of the top of the tower from the foot of the hill is 30°. If the tower is 50 m high, find the height of the hill.

22. A bucket is in the form of a frustum of a cone whose depth is 15 cm and the diameters of the top and the bottom are 56 cm and 42 cm respectively. How many litres of water can the bucket hold?

SECTION D

23. If p times the pth term of an AP is equal to q times its q th term, show that the (p+q) th term of the AP is zero.

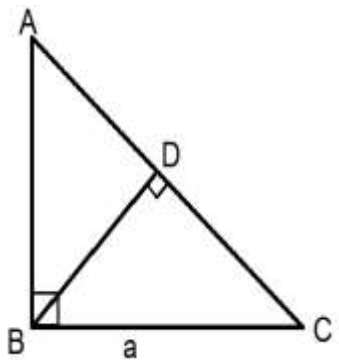
24. Draw a pair of tangents to a circle of radius 5 cm which are inclined to each other at an angle of 50°.

OR, Construct $\Delta PQR \sim \Delta ABC$ in which AB= 6.2 cm, BC= 5.4 cm and AC = 4 cm, using scale factor 1/3

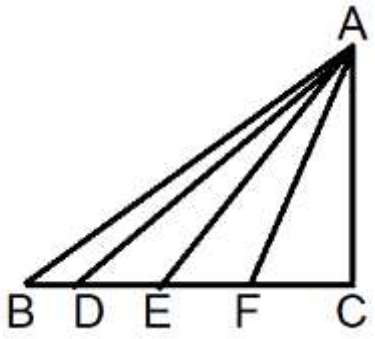
25. The angle of elevation of the top B of a tower AB from a point X on the ground is 60°. At a point Y, 40 m vertically above X, the angle of elevation is 45°. Find the height of the tower AB and the distance XB.

26. A trader with a basket of eggs finds that if he sells B eggs at a time there is only 1 egg left. If he sells 4 eggs at a time there is again 1 egg left. However if the trader sells 7 eggs at a time, there: are no eggs left. If the capacity of the basket is 100 eggs, find how many eggs are in the basket? Explain with reasoning.

27.In ΔABC, $<B=90^0$, $BD \perp AC$, ar (ΔABC) = A and BC = a, then prove that $BD = \frac{2Aa}{\sqrt{4A^2+a^4}}$



28. In right angled∆ABC, <C= 90° and D, E, F are three points on BC such that they divide it in equal parts. Then prove that $8(AF^2 + AD^2) = 11\,AC^2 + 5\,AB^2$



29. if $l\,cosec\theta + m\cot\theta + n = 0\ and\ l'cosec\theta + m'\cot\theta + n' = 0,$

$show\ that\ (mn' - m'n)^2 - (nl' - n'l)^2 = (l\,m' - l'm)^2$

Or, If $\cos(A + B) = 0\ and\ \cot(A - B) = \sqrt{3},$

$Find\ the\ value\ of\ (i)\ secA\ tanB - cotA.sinB\ (ii)\ cosecA.cotB + sinA.tanB$

30. Three lines x + 3y =6, ax – 3y = 12 and x = 0 are enclosing a beautiful triangular park. Find the points of intersection of the lines graphically and the area of the park, if all measurements are in km. What type of behavior should be expected by public in these type of parks?

OR,

Following frequency distribution shows the daily expenditure incurred on milk by 80 families. If mean is = 44, then find the missing frequencies x and y.

Daily expenditure	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90
Number of families	1	12	15	9	x	13	y	8	4