

10th Maths SA2 Sample Paper-6 (CBSE Board Exam 2018)

Time Allowed: 3 Hours

Max. Marks: 80

Section-A

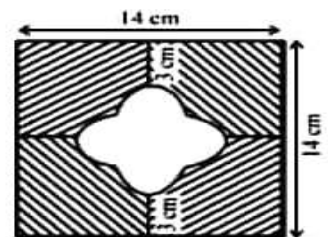
1. Explain why 13233343563715 is a composite number?
2. Solve the following quadratic equation for x: $4x^2 - 4a^2 (a^4 - b^4) = 0$.
3. If ratio of corresponding sides of two similar triangles is 5:6, then find ratio of their areas.
4. If the sum of n terms of an A.P. is given by $S_n = (3n^2 + 2n)$. find its nth term.
5. If the median of the series exceeds the mean by 3 find by what no. the mode exceeds its mean.
6. Show that $\operatorname{cosec}^2\theta - \tan^2(90^\circ - \theta) = \sin^2\theta + \sin(90^\circ - \theta)$

Section-B

7. Prove that $\sqrt{5}$ is irrational.
8. If the seventh term of an AP is $\frac{1}{9}$ and its ninth term is $\frac{1}{7}$. Find its 63rd term.
9. A card is drawn at random from a well shuffled pack of 52 playing cards. Find the probability of getting neither a red card nor a queen.
10. Determine the values of m and n so that the following system of linear equations have infinite number of solutions
 $(2m - 1)x + 3y - 5 = 0$ and $3x - (n - 1)y - 2 = 0$
11. If the point A (0, 2) is equidistant from the points B (3, p) and C (p, 5), find p. Also find the length of AB.
12. Two different dice are tossed together. Find the probability that the product of the two numbers on the top of the dice is 6.

Section-C

13. Prove that : $\frac{1}{3 + \sqrt{11}}$ is an irrational number.
14. If α and β are the zeroes of the polynomial $x^2 + 4x + 3$, find the polynomial whose zeroes are $1 + \frac{\beta}{\alpha}$ and $1 + \frac{\alpha}{\beta}$.
15. Find the coordinates of points which trisect the line segment joining (1, -2) and (-3, 4).
OR, Find the area of the triangle Formed by the points A (5, 2), B (4,7) and C (7, -4).
16. A circle inscribed in triangle ABC touches its sides AB, BC and AC at points D, E and F respectively. If AB = 12 cm. BC = 8cm and AC = 10 cm. then find the lengths AD, BE and CF.
17. Prove that $\tan^2\theta + \cot^2\theta + 2 = \sec^2\theta + \operatorname{cosec}^2\theta = \sec^2\theta \operatorname{cosec}^2\theta$
OR, If $\frac{\cos\theta + \sin\theta}{\cos\theta - \sin\theta} = \frac{1 + \sqrt{3}}{1 - \sqrt{3}}$ then find the value of θ
18. Solve the system of equations: $ax + by = 1$; $bx + ay = \frac{2ab}{a^2 + b^2}$
19. BL and CM are medians $\triangle ABC$ right angled at A. Prove that $4(BL^2 + CM^2) = 5BC^2$.



OR, In an equilateral triangle ABC. The side BC is trisected at D. Prove that $9 AD^2 = 7 AB^2$.

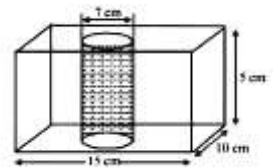
20. In figure find the area of the shaded region (Use $\pi = 3.141$)

21. The data regarding marks obtained by 48 students of a class in a class test is given below. Calculate the modal marks of students.

Marks Obtained	0 - 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50
Number of students	1	0	2	0	0	10	25	7	2	1

22. How many silver coins, 1.75 cm in diameter and of thickness 2 mm, must be melted to form a cuboid of dimensions 5.5 cm \times 10 cm \times 3.5 cm?

OR, In figure, from a cuboidal solid metallic block of dimensions 15 cm \times 10 cm \times 5 cm, a cylindrical hole of diameter 7 cm is drilled out. Find the surface area of the remaining block. Section-D



23. Solve for x: (i) $\frac{2x}{(x-3)} + \frac{1}{2x+3} + \frac{3x+9}{(x-3)(2x+3)} = 0$ OR, (ii) $\frac{1}{(x-1)(x-2)} + \frac{1}{(x-2)(x-3)} = \frac{2}{3}$

24. If $\sec\theta + \tan\theta = p$, show that $\sec\theta - \tan\theta = 1/p$ and find values of $\cos\theta$ and $\sin\theta$.

25. A thief runs away from a police station with a uniform speed of 100 m/minute. After one minute, a policeman runs behind the thief catch him. He goes at a speed 100 m/minute in first minute and increases his speed by 10m/min in each succeeding minute. How many minutes will the policeman take to catch the thief?

26. Construct a ΔABC in which $AB = 5$ cm, $BC = 6$ cm and $AC = 7$ cm. Now, construct a triangle similar to $\Delta A'B'C'$ such that each of its sides is two third of the corresponding sides of ΔABC .

27. A solid wooden toy is in the form of a hemisphere surmounted by a cone of same radius. The radius of hemisphere is 3.5 cm and the total wood used in the making of toy is 166 cm³. Find the height of the toy. Also, find the cost of painting the hemispherical part at the rate of Rs 10 per cm².

28. Prove that if a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then other two sides are divided in the same ratio.

OR, If a line divides any two sides of a triangle in the same ratio, then prove that the line is parallel to the third side.

29. Two ships are there in the sea on either side of light house in such a way that the ships and the light house are in the same straight line. Angles of depression of two ships are observed from the top of the light house are 60° and 45° . The height of light house is 200 m. Find the distance between the two ships. (Use $\pi = 1.731$)

OR, The angle of elevation of an aeroplane from a point on the ground is 60° . After a flight of 30 seconds the angle of elevation becomes 30° . If the aeroplane is flying at a constant height of $3000\sqrt{3}$ m, find the speed of the aeroplane.

30. If mean of the following data is 14.7, find the value of p and q.

Class	0 - 6	6-12	12 -18	18 - 24	24 -30	30 -36	36 - 42	Total
Frequency	10	p	4	7	q	4	1	40