

CBSE Sample Paper for Class 11 Maths Set 3

Max. Marks: 80

Time: 3 hours

Section A – All Questions Carry 1 Mark Each

1. Find the multiplicative inverse for $\sqrt{5} - 6i$.
2. If $A = \{2, 3, 4\}$, then what is $P(A)$?
3. Give the contrapositive of the following statement: If it rains, then they cancel school.
4. Write the condition on a and b such that AM, GM and HM of a and b are equal.
5. Can you justify why $\sqrt{4} = 2$ but $\sqrt{x^2} = |x|$ (where $|x|$ is modulus operator).
6. If $A = \{x: x \text{ is the positive number divisible by 5 and less than 20}\}$ then write the cardinality of set A .
7. Write the sample space when two coins are tossed.
8. What is the value of the slope of a line which is parallel to the y -axis?

Section B – All Questions Carry 4 Marks Each

1. When two events are called 'Mutually Exclusive' events? Represent two mutually exclusive sets A and B on a Venn diagram. What were these sets called in set theory parlance.
2. Write the simplified form for the given Sine series.

$$\sin(A) + \sin(A+d) + \sin(A+2d) + \dots + \sin(A + (n-1)d) = \underline{\hspace{2cm}}$$

Give the proof for above equation:

3. Plot the graph of quadratic polynomial, $y = x^2 - 2x + 1$ and represent the solution for same.
4. If $x^2 - bx + 4 = 0$ has two real roots and vertex lies on right side of y -axis. Then find the minimum integral value of b to satisfy the above condition.
5. Find ϕ and θ if
6. A circle has its centre at $(2, 3)$ and a point on the circle is the intersection of the lines

$$x, y \in R \text{ and } (4 + 5i)x + (3 - 2i)y + i^2 + 6i = 0.$$

$$3x - 2y - 1 = 0 \text{ and } 4x + y - 27 = 0. \text{ Find the equation of this circle.}$$

7. In the expansion of $(1+x)^n$, the ratio of the coefficients of three consecutive terms is 1 : 3 : 5.
Find n and the order of the three terms.
8. Find the sum of the sequence $a_n = 5n + 4$ for first 15 terms.
9. If first term of a Harmonic progression is 1 and third term is 9. Then find the 15th term of the same progression.
10. Prove that number of ways of selecting 3 members from 10 members is equal to number of ways of selecting 7 members from 10 members.
11. Find whether the points A(-2,3,5), B (1,2,3) and C(7,0,1) are collinear using: Distance formula and Section formula
12. The vertices of a tetrahedron are A(-2,3,4), B(3,-4,2), C(2,-5,2) and D(a,b,c). The centroid of the tetrahedron is (0, -1, 5/2). Find the value of $a + b - c$.

Section C – All Questions Carry 6 Marks Each

1. Let $\cos(\alpha) = -\frac{1}{4}$ and $-\pi < \alpha < -\frac{\pi}{2}$. Use the information to find the value of $\sin\left(\frac{\alpha}{2}\right)$, $\cos\left(\frac{\alpha}{2}\right)$ and $\tan\left(\frac{\alpha}{2}\right)$

2. What is the number of ways of choosing 4 cards from a pack of 52 playing cards? In how many of these
 - a. four cards are of same suit.
 - b. cards are of same colour.
 - c. two are red cards and two are black cards.
 - d. cards are of black colour.

3. Find the solution graphically for the following system of inequalities:

$$\begin{aligned} x &\geq 0 \\ 4x + 5y &\geq 20 \\ 2x + y &\leq 8 \end{aligned}$$

4. Solve the following:

- a) What are harmonic conjugates?
- b) Calculate the ratio in which P(2,3,4) divides the line joining of A(3,-2,2), B (6, -17, -4).
- c) Write the harmonic conjugate of point P in (b).