Nishant eAcademy

CBSE Sample Paper Class 12 Mathematics 2020-21

Subject: Mathematics Class: 12 Maximum Marks: 100 Duration: 3 hours

Section A: Objective Type (20 marks)

1. Multiple Choice Questions: a) If A and B are two events such that P(A) = 0.4, P(B) = 0.7, and P(A ∩ B) = 0.2, then P(A' ∩ B') is equal to: (A) 0.02 (B) 0.48 (C) 0.58 (D) 0.78

b) The sum of the first n terms of an arithmetic progression is given by Sn = 3n^2 + 2n. Find the common difference of the arithmetic progression. (A) 2 (B) 3 (C) 4 (D) 5

2. Fill in the blanks: a) The derivative of y = 4x^3 - 5x^2 + 2x - 1 with respect to x is _____. b) In a right-angled triangle, the side opposite to the right angle is called the _____.

Section B: Short Answer Type (30 marks)

3. Find the equation of the tangent line to the curve y = x^2 - 3x + 2 at the point (2, -2).

4. Solve the following system of equations: 2x + 3y = 7 4x - y = 1

5. Find the value of sin^2(45°) + cos^2(45°).

Section C: Long Answer Type (50 marks)

6. Prove that the sum of the squares of the sides of a parallelogram is equal to the sum of the squares of its diagonals.

7. Find the equation of the ellipse whose major axis is parallel to the x-axis, center at (3, -2), and passes through the points (4, 1) and (2, -5).

8. A company produces two types of products A and B. The profit per unit of product A is Rs. 10 and the profit per unit of product B is Rs. 15. The company can produce a maximum of 300 units of product A and 200 units of

product B. The company wants to maximize its profit. Formulate this as a linear programming problem.