

CLASS XII MATHEMATICS SAMPLE PAPER – 1

Time: 3 Hours **Maximum Marks:** 80

Instructions: Attempt all questions. Show complete working. Calculators are not permitted.

Section A – MCQs (10×1)

1. If A is a square matrix, $|A|$ denotes ____.
2. Derivative of x^2 is ____.
3. $\int_0^1 x \, dx =$ ____.
4. Dimension of a 3×4 matrix is ____.
5. Probability lies between ____.
6. Direction cosines satisfy ____.
7. Equation of tangent uses ____.
8. Value of $\sin^2\theta + \cos^2\theta$.
9. Number of solutions of a consistent system.
10. Vector $\mathbf{i} \cdot \mathbf{j} =$ ____.

Section B – Very Short

11. Find determinant of $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$.
12. Differentiate $\sin x$.
13. Integrate $\int 2x \, dx$.
14. Find inverse of $f(x) = 2x + 3$.
15. Write equation of x-axis.

Section C – Short

16. Solve a system of linear equations using matrices.
17. Differentiate $x^3 + 5x$.
18. Evaluate $\int (x^2 + 1) dx$.
19. Find equation of tangent to $y = x^2$ at $x = 2$.
20. Solve a basic linear programming problem graphically.
21. Find probability of drawing an ace from a standard deck.

Section D – Long

22. Solve application of definite integration to find area under a curve.
23. Prove properties of determinants with suitable examples.
24. Solve vector application involving dot product.
25. Solve 3D geometry problem involving distance between two points.

Section E – Case Study/HOTS

26. A company models profit using a quadratic function. Use derivatives to analyse increasing behaviour.

27. A warehouse location is represented in 3D coordinates. Determine distances and vector relationships.