

CLASS XII MATHEMATICS SAMPLE PAPER – 2

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

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

Section A – MCQs (10×1)

1. Order of a 2×5 matrix is ____.
2. Derivative of e^x is ____.
3. Integral of $1/x$ dx is ____.
4. Determinant of identity matrix is ____.
5. Magnitude of unit vector is ____.
6. Probability cannot exceed ____.
7. Equation of normal is perpendicular to ____.
8. Direction ratios represent ____.
9. Inverse trigonometric function domain question.
10. LPP optimum occurs at ____.

Section B – Very Short

11. Find determinant of $\begin{bmatrix} 2 & 1 \\ 5 & 3 \end{bmatrix}$.
12. Differentiate $\ln x$.
13. Evaluate $\int 3x^2 dx$.
14. Solve $dy/dx = 2x$.
15. Find vector joining (1,2,3) and (4,5,6).

Section C – Short

16. Solve linear equations using inverse matrix method.
17. Differentiate $x^2 \sin x$.
18. Evaluate $\int (2x+5) dx$.
19. Find tangent and normal to $y=x^3$ at $x=1$.
20. Solve a linear programming problem graphically.
21. Probability of drawing two red cards successively without replacement.

Section D – Long

22. Evaluate a definite integral and interpret it as area under the curve.
23. Prove a property of determinants using suitable matrices.
24. Solve vector problems involving dot and cross products.
25. Find shortest distance between two points in three-dimensional space and interpret geometrically.

Section E – Case Study/HOTS

26. A manufacturer models cost and revenue functions. Use derivatives to determine maximum profit conditions.

27. A drone moves through three-dimensional coordinates. Use vectors and 3D geometry to determine displacement and distance travelled.