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CLASS 12

Mathematics

Chapterwise Important Questions

13 sections | 52 original questions | 2026-27

Read each chapter, attempt the questions, and support explanations with working or textbook evidence.

Choose a chapter or topic

Mathematics	
Chapter 1	Relations and Functions
Chapter 2	Inverse Trigonometric Functions
Chapter 3	Matrices
Chapter 4	Determinants
Chapter 5	Continuity and Differentiability
Chapter 6	Application of Derivatives
Chapter 7	Integrals
Chapter 8	Application of Integrals
Chapter 9	Differential Equations
Chapter 10	Vector Algebra
Chapter 11	Three Dimensional Geometry
Chapter 12	Linear Programming
Chapter 13	Probability

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CHAPTER 1

Relations and Functions

Mathematics

1. Test whether the relation aRb if a-b is even on integers is an equivalence relation.
2. Determine whether f(x)=2x+3 from R to R is one-one and onto.
3. Give an example of a function that is onto but not one-one.
4. For $f(x)=x^2$ on R, explain how restricting domain and codomain changes one-one and onto properties.

CHAPTER 2

Inverse Trigonometric Functions

Mathematics

1. Find the principal value of sin inverse(-1/2).
2. Explain why an inverse trigonometric function needs a restricted principal range.
3. Evaluate tan inverse(1)+tan inverse(sqrt(3)).
4. Simplify sin(sin inverse x) and state the allowed values of x.

CHAPTER 3

Matrices

Mathematics

1. Multiply [[1,2],[3,4]] by [[2,0],[1,2]].
2. Explain why matrix multiplication is not generally commutative.
3. Express a square matrix as the sum of a symmetric and a skew-symmetric matrix.
4. Find the inverse of [[2,1],[1,1]] and verify it by multiplication.

CHAPTER 4

Determinants

Mathematics

1. Evaluate the determinant of [[3,2],[5,4]].
2. Find k for which [[k,2],[3,6]] is singular.
3. Use determinants to find the area of a triangle with vertices (0,0), (4,0), (1,3).
4. Solve x+2y=7 and 3x-y=7 using an inverse matrix, stating the non-singularity condition.

CHAPTER 5

Continuity and Differentiability

Mathematics

1. Find k for continuity of f(x)=kx+1 for x<2 and f(x)=7 for x>=2 at x=2.
2. Explain why differentiability implies continuity but the converse can fail.
3. Differentiate x^2 sin x.
4. Differentiate y=ln(x^2+1) and identify its real domain.

CHAPTER 6

Application of Derivatives

Mathematics

1. Find the intervals where f(x)=x^3-3x increases and decreases.
2. Find and classify the stationary points of x^2-6x+5.
3. A rectangle has perimeter 40 cm. Find its maximum possible area.

4. Find the rate of change of a circle's area when its radius is 5 cm and increasing at 2 cm/s.

CHAPTER 7

Integrals

Mathematics

1. Integrate $3x^2+2x-1$.
2. Evaluate the integral of $2x/(x^2+1)$ by substitution.
3. Evaluate the integral of x e^x by parts.
4. Evaluate the definite integral of sin x from 0 to pi.

CHAPTER 8

Application of Integrals

Mathematics

1. Find the area between $y=x$ and $y=x^2$ from $x=0$ to $x=1$.
2. Find the area under $y=4-x^2$ above the x-axis.
3. Explain why a signed definite integral may differ from total geometric area.
4. Set up an integral for the area enclosed by $x=y^2$ and $x=4$.

CHAPTER 9

Differential Equations

Mathematics

1. State the order and degree of $(d^2y/dx^2)^2+dy/dx=0$.
2. Solve $dy/dx=3x^2$ with $y(0)=2$.

3. Solve dy/dx=y by separation of variables.

4. Form a differential equation for the family y=Ce^(2x).

CHAPTER 10

Vector Algebra

Mathematics

1. Find the dot and cross products of (1,2,3) and (2,0,1).

2. Find a unit vector along (2,-1,2).

3. Explain the geometrical condition for two non-zero vectors to have zero dot product.

4. Use vectors to find the area of the parallelogram spanned by (2,0,0) and (1,3,0).

CHAPTER 11

Three Dimensional Geometry

Mathematics

1. Find the angle between lines with direction vectors (1,2,2) and (2,1,-2).

2. Write the vector and Cartesian equations of a line through (1,2,3) parallel to (2,-1,4).

3. Explain how to distinguish intersecting, parallel and skew lines.

4. Find the shortest distance between the lines r=(0,0,0)+s(1,0,0) and r=(0,1,1)+t(0,1,0).

CHAPTER 12

Linear Programming

Mathematics

1. Maximise Z=3x+2y subject to x+y<=4, x<=2, x>=0, y>=0 using a graph.
2. Explain the meaning of a feasible region.
3. Give an example of an unbounded feasible region and explain why the objective may still have a minimum.
4. Explain how parallel objective lines can produce more than one optimal solution.

CHAPTER 13

Probability

Mathematics

1. Two cards are drawn without replacement. Find the probability both are aces.
2. State Bayes' theorem and explain the role of prior probabilities.
3. A and B are independent with probabilities 0.4 and 0.5. Find the probability that exactly one occurs.
4. A bag has 3 red and 2 blue balls. Given that a first draw without replacement is red, find the probability that the second is blue.

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