Class12-Maths-CBSE-Exam-Formulas

October 18, 2025

Chapter	Concept	Formula / Key Point
Relations and Functions	Types of Relations	Reflexive, Symmetric, Transitive, Equivalence
	—	—
	Types of Functions	One-one, Onto, Bijective
	—	—
	Inverse of Function	$f^{-1}(f(x)) = x$
	—	—
Inverse Trigonometric Functions	Principal Values	$\sin^{-1} x \in [-\frac{\pi}{2}, \frac{\pi}{2}]$ $\cos^{-1} x \in [0, \pi]$
	—	—
	Identities	$\sin^{-1} x + \cos^{-1} x = \frac{\pi}{2}$ $\tan^{-1} x + \cot^{-1} x = \frac{\pi}{2}$
	—	—
Matrices	Matrix Operations	$(A+B)^T = A^T + B^T$, $(AB)^T = B^T A^T$
	—	—
	Inverse of Matrix	$A^{-1} = \frac{1}{\lvert A\rvert} \cdot \text{adj}(A)$ if $\lvert A\rvert \neq 0$
	—	—
Determinants	Properties	$\lvert AB\rvert = \lvert A\rvert\lvert B\rvert$, $\lvert A^T\rvert = \lvert A\rvert$
	—	—
	Area of Triangle	Area $= \frac{1}{2}\begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}$
	—	—
	Cramer's Rule	$x = \frac{D_x}{D}, \quad y = \frac{D_y}{D}, \quad z = \frac{D_z}{D}$
	—	—
Continuity and Differentiability	Continuity	$\lim_{x \to a^-} f(x) = \lim_{x \to a^+} f(x) = f(a)$
	—	—
	Derivatives	$(uv)' = u'v + uv'$ $(f(g(x)))' = f'(g(x)) \cdot g'(x)$
	—	—
	Implicit Differentiation	Differentiate both sides of equation w.r.t. x

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Applications of Derivatives	Tangent & Normal	Slope of tangent: $f'(x)$ Equation: $y - y_1 = m(x - x_1)$
	—	—
	Increase/Decrease	$f'(x) > 0$ Increasing $f'(x) < 0$ Decreasing
	—	—
	Maxima & Minima	Use $f'(x) = 0$ and second derivative test
	—	—
Integrals	Basic Integration	$\int x^n dx = \frac{x^{n+1}}{n+1} + C$, $n \neq -1$ $\int e^x dx = e^x + C$
	—	—
	Integration by Parts	$\int u \cdot v \, dx = u \int v dx - \int \left(\frac{du}{dx} \int v dx \right) dx$
	—	—
	Definite Integral	$\int_a^b f(x)\, dx = F(b) - F(a)$ $\int_a^b f(x)\, dx = \int_a^b f(a + b - x)\, dx$
	—	—
Applications of Integrals	Area Under Curve	Area $= \int_a^b [f(x) - g(x)] dx$
	—	—
	Area Between Curve and Axis	Area $= \int_a^b f(x) dx$
	—	—
Differential Equations	Order and Degree	Order = highest derivative, Degree = power of highest derivative (if polynomial)
	—	—
	Variable Separable Method	$\frac{dy}{dx} = f(x)g(y) \Rightarrow \frac{dy}{g(y)} = f(x)dx$
	—	—
Vector Algebra	Dot Product	$\vec{A} \cdot \vec{B} = \lvert\vec{A}\rvert\lvert\vec{B}\rvert \cos\theta$
	—	—
	Cross Product	$\vec{A} \times \vec{B} = \lvert\vec{A}\rvert\lvert\vec{B}\rvert \sin\theta \hat{n}$
	—	—
	Scalar Triple Product	$\vec{A} \cdot (\vec{B} \times \vec{C}) = \begin{vmatrix} A_x & A_y & A_z \\ B_x & B_y & B_z \\ C_x & C_y & C_z \end{vmatrix}$
	—	—
Three-Dimensional Geometry	Line Equation	Vector: $\vec{r} = \vec{a} + \lambda \vec{b}$ Cartesian: $\frac{x - x_1}{l} = \frac{y - y_1}{m} = \frac{z - z_1}{n}$
	—	—
	Plane Equation	$ax + by + cz + d = 0$ Vector: $\vec{r} \cdot \hat{n} = d$
	—	—
	Distance Between Point & Plane	$\frac{\lvert ax_1 + by_1 + cz_1 + d \rvert}{\sqrt{a^2 + b^2 + c^2}}$

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Linear Programming	Constraints & Feasible Region	Convert word problems to inequalities Graph feasible region
	—	—
	Objective Function	$Z = ax + by$ Max/Min at corner points of feasible region
	—	—
Probability	Conditional Probability	$P(A\|B) = \frac{P(A \cap B)}{P(B)}$
	—	—
	Bayes' Theorem	$P(E_i\|A) = \frac{P(E_i) \cdot P(A\|E_i)}{\sum P(E_j) \cdot P(A\|E_j)}$
	—	—
	Independent Events	$P(A \cap B) = P(A) \cdot P(B)$