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ENGINEERING ENTRANCE

JEE Main & Advanced

Maths Formula Sheet

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Algebra

- Quadratic roots: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$.
- AP sum: $S_n = \frac{n}{2} [2a + (n-1)d]$.
- GP sum: $S_n = \frac{a(r^n - 1)}{(r - 1)}$, r not equal to 1.
- Binomial theorem for $(a+b)^n$ with general term.

Trigonometry & Calculus

- $\sin^2(x) + \cos^2(x) = 1$; $1 + \tan^2(x) = \sec^2(x)$.
- $\frac{d}{dx}(x^n) = n x^{(n-1)}$; $\frac{d}{dx}(\sin x) = \cos x$.
- Integral of $x^n = \frac{x^{(n+1)}}{(n+1)} + C$ ($n \neq -1$).
- Limits, continuity and differentiability basics.

Coordinate Geometry & Vectors

- Slope form: $y = mx + c$; distance formula.
- Circle: $(x-h)^2 + (y-k)^2 = r^2$.
- Dot product $a \cdot b = |a||b|\cos(\theta)$.
- Cross product magnitude = $|a||b|\sin(\theta)$.

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