FREE CALCULUS FORMULA SHEET

Core Set of Formulas That Are a Must Know

Master your Calculus skills with this handy formula sheet. Keep it by your side as you practice — boost confidence, save time, and score higher.

Differentiation

- Power Rule: $d/dx\ [x^n] = n \cdot x^{n-1}$
- Product Rule: $(fg)' = f'g + fg'$
- Quotient Rule: $(f/g)' = (f'g - fg')/g^2$
- Chain Rule: $d/dx\ [f(g(x))] = f'(g(x)) \cdot g'(x)$
- Trig Derivatives:
  - $d/dx\ [\sin x] = \cos x$
  - $d/dx\ [\cos x] = -\sin x$
  - $d/dx\ [\tan x] = \sec^2 x$
- Exponential & Logarithmic Derivatives:
  - $d/dx\ [e^x] = e^x$
  - $d/dx\ [\ln x] = 1/x$

Integration

- Basic Rules:
  - $\int x^n\, dx = (x^{n+1})/(n+1) + C,\ n \neq -1$
  - $\int e^x\, dx = e^x + C$
  - $\int 1/x\, dx = \ln|x| + C$
- u-Substitution: $\int f(g(x)) \cdot g'(x)\, dx \rightarrow \int f(u)\, du$
- Integration by Parts: $\int u\, dv = uv - \int v\, du$
- Trig Integrals (examples):
  - $\int \sin x\, dx = -\cos x + C$
  - $\int \cos x\, dx = \sin x + C$
  - $\int \sec^2 x\, dx = \tan x + C$

Limits & Continuity

- Standard Limit Laws:
  $\lim (f(x) + g(x)) = \lim f(x) + \lim g(x)$
- L'Hôpital's Rule:
  If $\lim f(x)/g(x)$ is $0/0$ or ∞/∞, then
  $\lim f/g = \lim f'/g'$
- Continuity:
  $f(x)$ is continuous at c if $\lim x \rightarrow c\ f(x) = f(c)$

Sequences & Series

- Geometric Series:
  $\Sigma\, ar^n = a/(1-r),\ |r| < 1$
- Taylor/Maclaurin Expansion:
  $f(x) \approx f(a) + f'(a)(x-a) + f''(a)(x-a)^2/2! + \ldots$

Tip: Formulas are only half the battle — practice recognizing when to use them. On the AP exam, spotting patterns (like a composite function for the chain rule or a quotient for L'Hôpital's) will save you time and boost accuracy.

Need help mastering these formulas?

Our Ivy League Calculus Tutors are here to help you reach your target score.

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