

Beginning Differentiation Formulas

c = constant u, v = expression containing x n, m = integers

Functional Notation	Leibniz Notation
1. Sum Rule: $(f + g)' = f' + g'$	1. Sum Rule: $\frac{d(u + v)}{dx} = \frac{du}{dx} + \frac{dv}{dx}$
2. Constant Rule: $c' = 0$	2. Constant Rule: $\frac{dc}{dx} = 0$
3. Product Rule: $(fg)' = f'g + g'f$	3. Product Rule: $\frac{d(uv)}{dx} = u \frac{dv}{dx} + v \frac{du}{dx}$
4. Quotient Rule: $\left(\frac{f}{g}\right)' = \frac{gf' - fg'}{g^2}$	4. Quotient Rule: $\frac{d\left(\frac{u}{v}\right)}{dx} = \frac{v \frac{du}{dx} - u \frac{dv}{dx}}{v^2}$
5. x to a power: $(x^n)' = nx^{n-1}$	5. x to a power: $\frac{dx^n}{dx} = nx^{n-1}$
6. Chain Rule: $(u^m)' = mu^{m-1} \cdot u'$	6. Chain Rule: $\frac{du^m}{dx} = mu^{m-1} \frac{du}{dx}$