

## Derivatives Cheat Sheet

Rule	Function	Derivative	Example
Power Rule	$x^n$	$\rightarrow nx^{n-1}$	$\frac{d}{dx} x^4 = 4x^3$
Product Rule	$fg$	$\rightarrow fg' + f'g$	$\frac{d}{dx} x^4y^5 = 5x^4y^4 + 4x^3y^5$
Quotient Rule	$\frac{f}{g}$	$\rightarrow \frac{f'g - g'f}{g^2}$	$\frac{d}{dx} \frac{\cos(x)}{x} = \frac{x(-\sin(x)) - \cos(x)(1)}{x^2}$ $= \frac{\cos(x) + x\sin(x)}{x^2}$
Chain Rule	$f(g(x))$	$\rightarrow f'(g(x))g'(x)$	$\frac{d}{dx} \cos(x^2) = -\sin(x^2) 2x$ $= -2x\sin(x^2)$

### Tip!

Remember the derivative of trig functions:

$$\frac{d}{dx} \cos(x) = -\sin(x)$$

$$\frac{d}{dx} \sin(x) = \cos(x)$$

$$\frac{d}{dx} \tan(x) = \sec^2(x)$$