

### Basic Properties/Formulas/Rules

$$(fg)' = f'g + fg'$$

$$(f/g)' = (f'g - fg') / (g^2)$$

$$d/dx(f(g(x))) = f'(g(x))g'(x)$$

$$d/dx(e^{g(x)}) = g'(x)e^{g(x)}$$

$$d/dx(\ln g(x)) = g'(x)/g(x)$$

$$d/dx(x^n) = nx^{n-1}$$

$$d/dx(c) = 0, c \text{ is any constant}$$

$$b^x = e^{x \ln b}$$

### Common Derivatives (cont)

$$d/dx(\cot^{-1}x) = -1/(1+x^2)$$

### Common Derivatives

*Polynomials*  $d/dx(c) = 0$

$$d/dx(x) = 1$$

$$d/dx(cx) = c$$

$$d/dx(x^n) = nx^{n-1}$$

$$d/dx(cx^n) = ncx^{n-1}$$

*Trig Functions*  $d/dx(\sin x) =$

$$\cos x$$

$$d/dx(\cos x) = -\sin x$$

$$d/dx(\tan x) = \sec^2 x$$

$$d/dx(\sec x) = \sec x \tan x$$

$$d/dx(\csc x) = -\csc x \cot x$$

$$d/dx(\cot x) = -\csc^2 x$$

*Inverse Trig Functions*  $d/dx(\sin^{-1}x) =$

$$1/\sqrt{1-x^2}$$

$$d/dx(\cos^{-1}x) = -1/\sqrt{1-x^2}$$

$$d/dx(\tan^{-1}x) = 1/(1+x^2)$$

$$d/dx(\sec^{-1}x) = 1/|x|\sqrt{x^2-1}$$

$$d/dx(\csc^{-1}x) = -1/|x|\sqrt{x^2-1}$$



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