The Chain Rule

Quick Rule Cheat Sheet

You should know how to use The Chain Rule. However, it is very useful to know the following rules by heart. It is important to know **how to use them** – check that you get the same answers for the examples.

Function	Derivative	Example
$(ax + b)^n$	$n \cdot a \cdot (ax + b)^{n-1}$	$\frac{d}{dx}(3x - 2)^5 = 15(3x - 2)^4$
$[f(x)]^n$	$n \cdot f'(x) \cdot [f(x)]^{n-1}$	$\frac{d}{dx}(lnx)^3 = \frac{3(lnx)^2}{x}$
$e^{f(x)}$	$f'(x) \cdot e^{f(x)}$	$\frac{d}{dx}e^{3x^2} = 6xe^{3x^2}$
$\ln[f(x)]$	$\frac{f'(x)}{f(x)}$	$\frac{d}{dx}\ln[sinx] = \frac{cosx}{sinx}$
$g(f(x))$	$f'(x) \cdot g'(f(x))$	$\frac{d}{dx}\sin(\ln x) = \frac{\cos(lnx)}{x}$

NOTE " $\cdot$ " is a symbol used to represent a product. It is not necessary, but it is used here to help our eyes see the separate parts of the rules