

Chapter 1

Higher Derivatives

Higher derivatives are derivatives of derivatives. For instance, if y' is the derivative of y , then y'' is the derivative of y' .

Table 1.1: All the different notations for higher derivatives

y'	$\frac{d}{dx}y$	$\frac{dy}{dx}$	Dy
y''	$\left(\frac{d}{dx}\right)^2 y$	$\frac{d^2 y}{dx^2}$	$D^2 y$
y'''	$\left(\frac{d}{dx}\right)^3 y$	$\frac{d^3 y}{dx^3}$	$D^3 y$
$y^{(4)}$	$\left(\frac{d}{dx}\right)^4 y$	$\frac{d^4 y}{dx^4}$	$D^4 y$
$y^{(n)}$	$\left(\frac{d}{dx}\right)^n y$	$\frac{d^n y}{dx^n}$	$D^n y$

Higher derivatives are pretty straightforward — just keep taking the derivative!