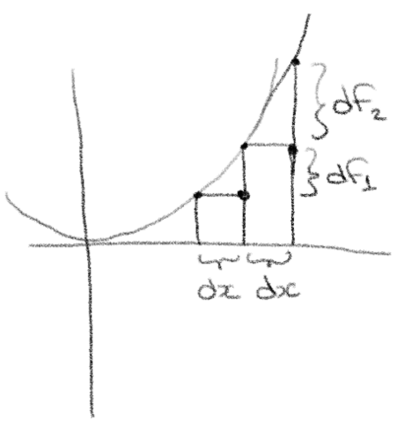
Higher order derivatives - similarily measure change - but instead of the thing that is changing it measures the change (at some abstraction) of the thing changing:

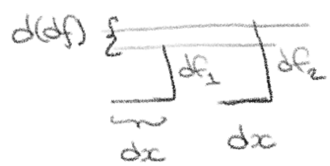
$$\frac{d}{dx}\left(\frac{df}{dx}\right) \Longrightarrow \frac{d^2f}{dx^2}$$

$dx \longrightarrow 0$

higher orders are formally written this way.

$d(df) \approx (\text{some constant})(dx^2)$



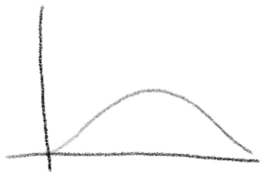


$dx = 0.01 \Rightarrow (dx)^2 = 0.0001.$

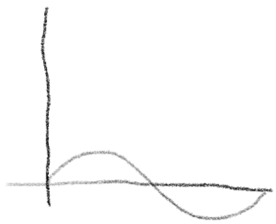
Higher order derivatives are great for approximating functions (Taylor Series.

For Exemple - classic Physic's Displacement

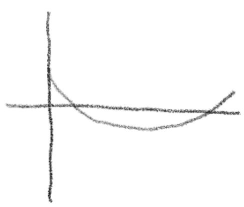
$s(t) \Leftrightarrow$ Displacement



$\frac{ds}{dt}(t) \Leftrightarrow$ Velocity



$\frac{d^2s}{dt^2} \Leftrightarrow$ Acceleration



$\frac{d^3s}{dt^3} \Leftrightarrow$ Jerk.