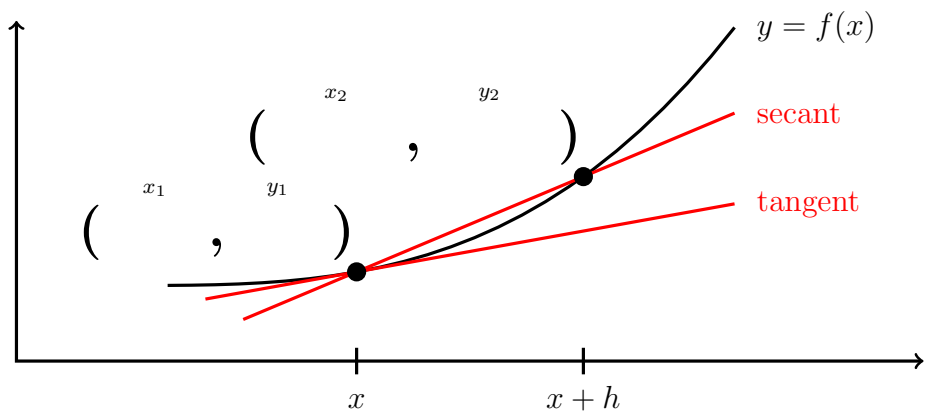


The Limit Definition of Derivative

Suppose the height of a ball is a function of time  $y = f(x)$ .

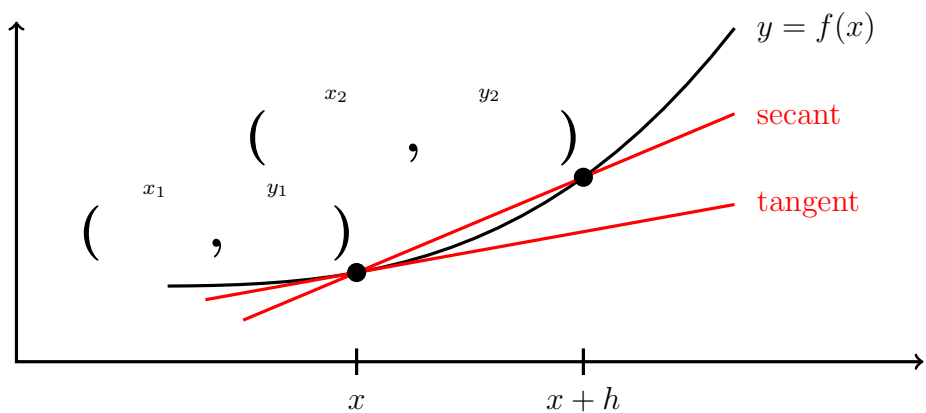


average velocity over  $[x, x+h]$  = average rate of change over  $[x, x+h]$  = slope of secant between  $x, x+h$  =  $\frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} =$   = definition of difference quotient

velocity at  $x$  = rate of change at  $x$  = slope of tangent at  $x$  =  = definition of derivative  $f'(x)$

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