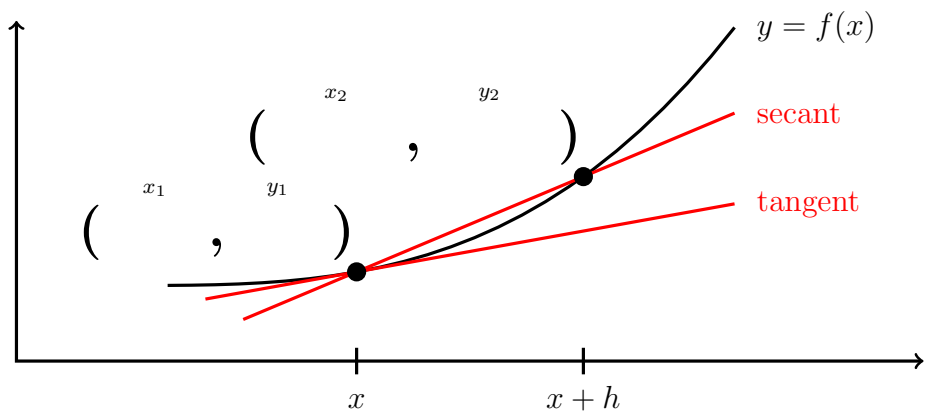


The Limit Definition of Derivative

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

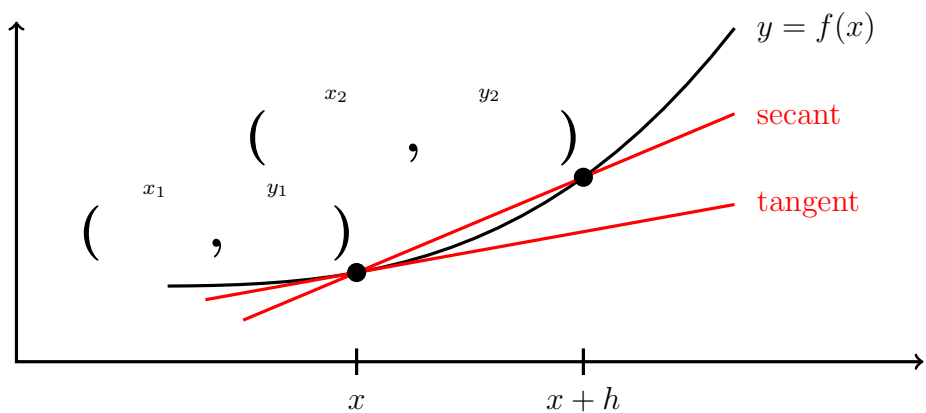


average velocity over $[x, x+h]$ = average rate of change over $[x, x+h]$ = slope of secant between $x, x+h$ = $\frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} =$ = definition of difference quotient

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

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