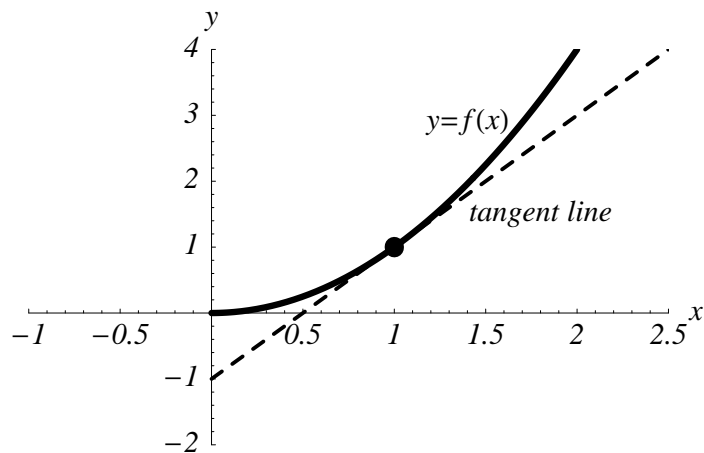


THE DERIVATIVE

... a bit of calculus ...

Consider a function $f(x)$ and its graph.



The slope of the graph at a point is

$$\text{slope} = \lim_{\Delta x \rightarrow 0} \frac{\Delta f}{\Delta x} = f'(x).$$

- ▶ Rate of change of f at the point x
- ▶ Same as the slope of the tangent line

Some Examples

$$f(x) = C \quad \Longrightarrow \quad f'(x) = 0$$

$$f(x) = Cx \quad \Longrightarrow \quad f'(x) = C$$

$$f(x) = Cx^p \quad \Longrightarrow \quad f'(x) = Cpx^{p-1}$$

$$f(x) = f_1(x) + f_2(x) \quad \Longrightarrow \quad f'(x) = f'_1(x) + f'_2(x)$$

$$f(x) = \frac{A(x)}{B(x)} \quad \Longrightarrow \quad f' = \frac{BA' - AB'}{B^2}$$