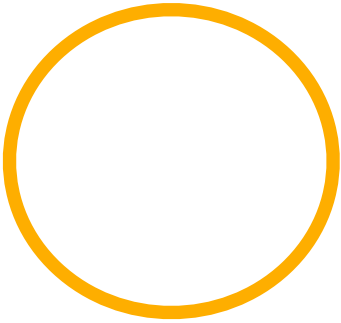




mean value theorem

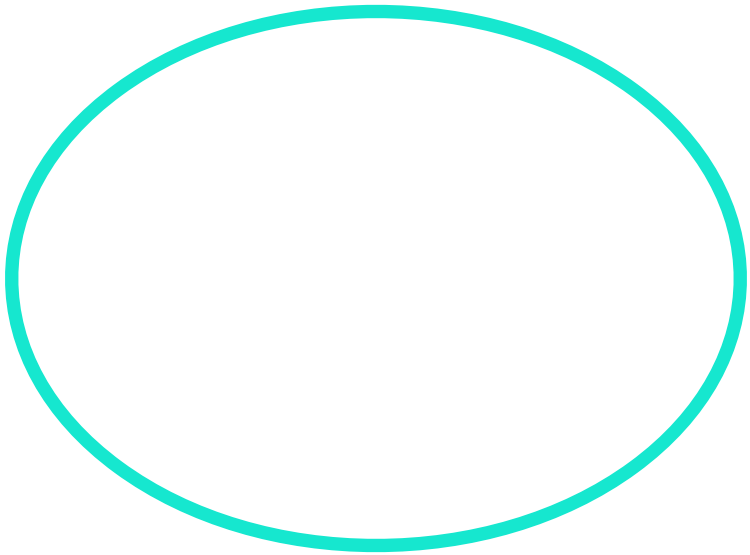








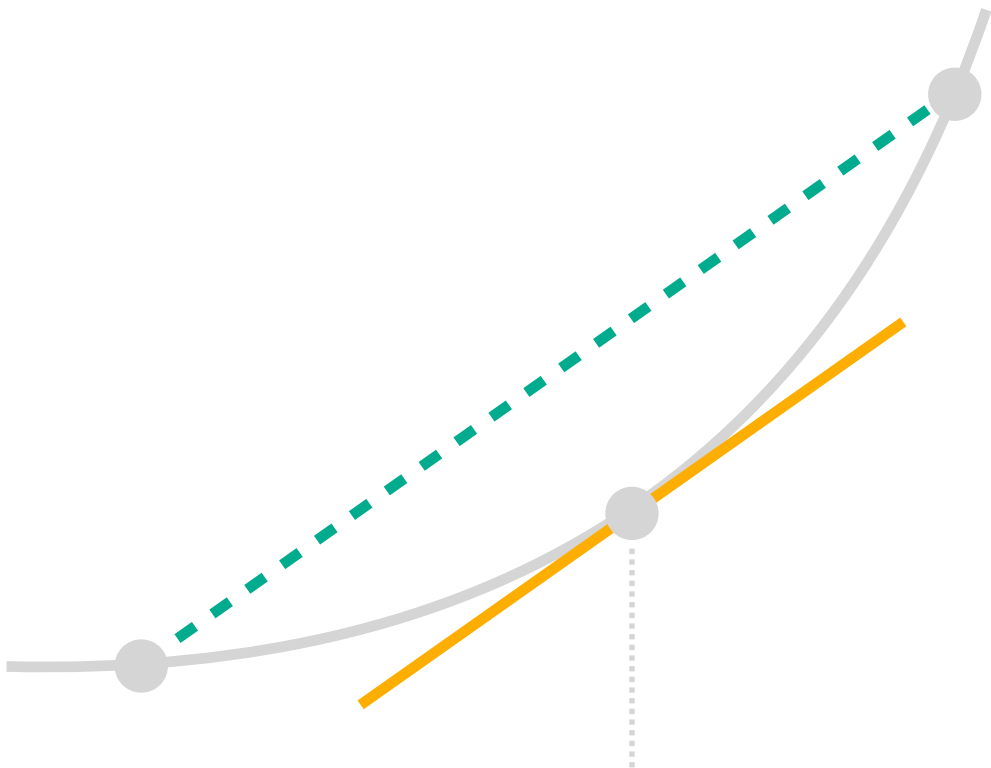
slope of the tangent line







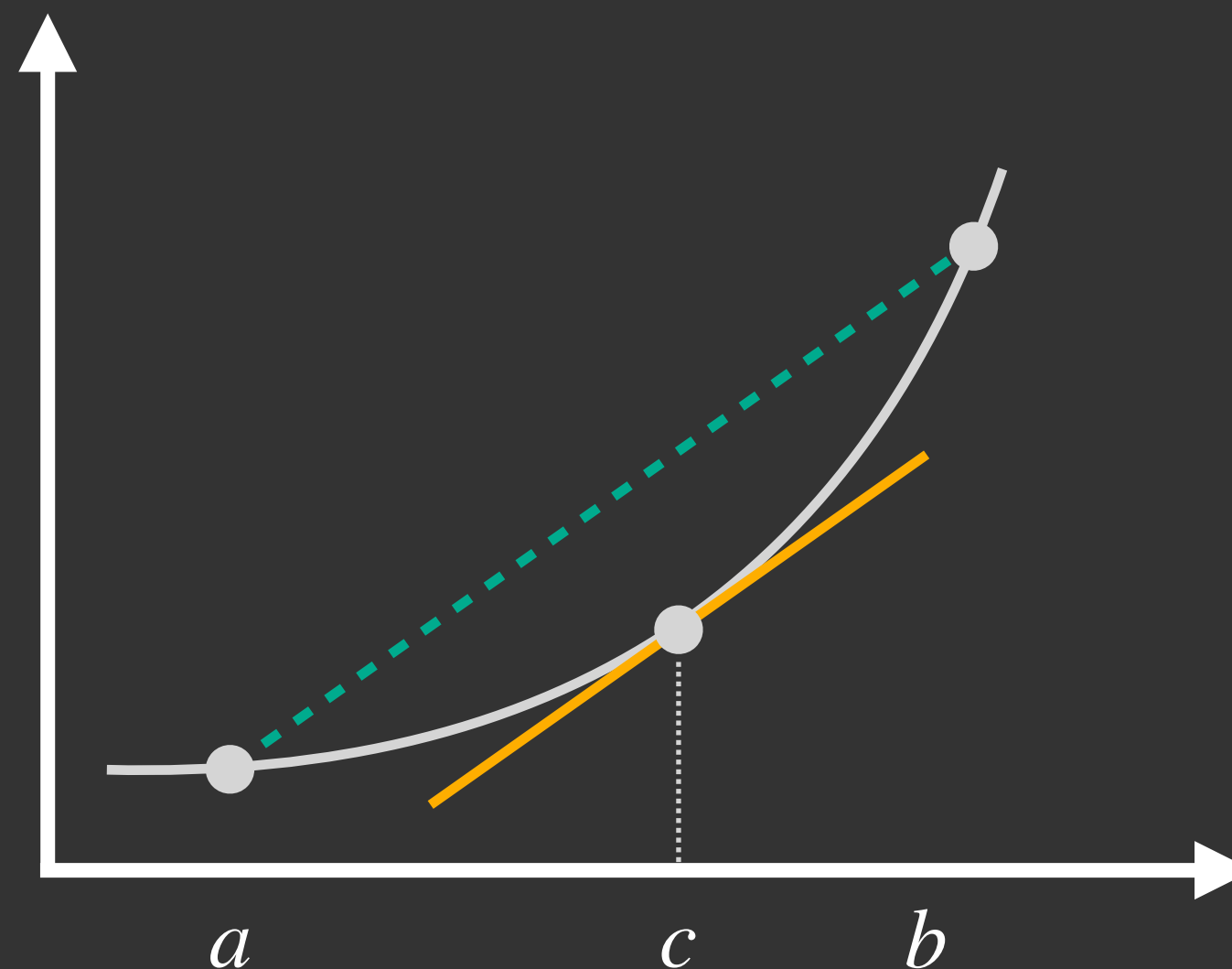
slope of the secant line between  
 $x = a$  and  $x = b$



# mean value theorem

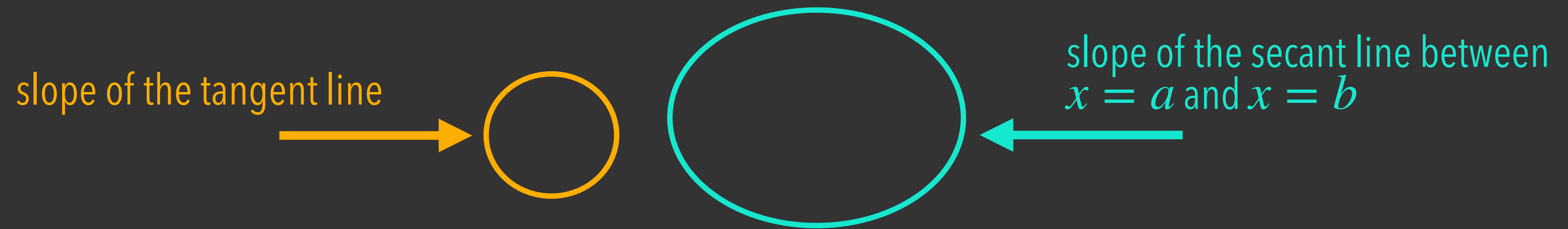
Suppose  $f(x)$  is a continuous function on closed interval  $[a, b]$  and is differentiable on the interval's interior  $(a, b)$  at which a point  $c$  exists such that

slope of the tangent line  $\rightarrow f'(c) = \frac{f(b) - f(a)}{b - a} \leftarrow$  slope of the secant line between  $x = a$  and  $x = b$



note: there can be more than one such value of  $c$

# mean value theorem generalized



this is the idea behind Taylor's Theorem and using polynomials to approximate a smooth function