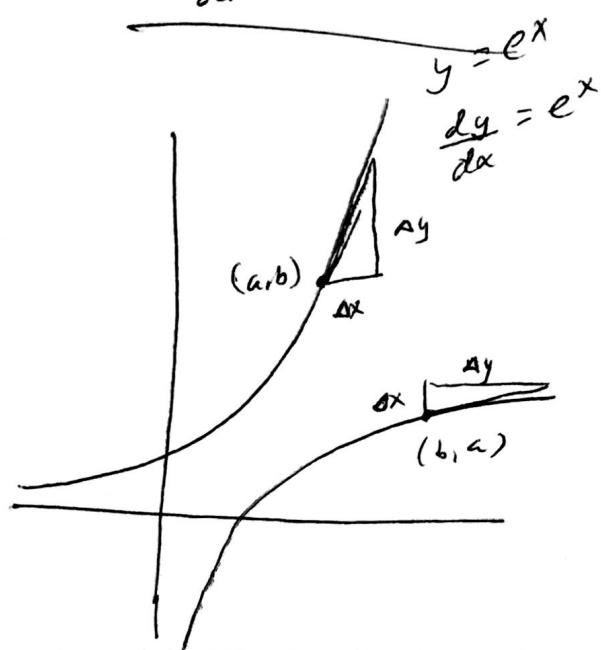


$$\frac{d}{dx}(\ln x)$$



draw congruent triangles

$$y = \ln x$$

$$e^y = x$$

$$\frac{dx}{dy} = e^y$$

want

$$\frac{dy}{dx} = \frac{1}{e^y}$$

$$= \frac{1}{x} \quad \text{since } e^y = x$$

Can do this w/ other functions such as $y = x^3$ and $y = \sqrt[3]{x}$ to show/conform reciprocal aspects of inverse function derivatives

$$\text{let } g = f^{-1}, \quad f(a) = b, \quad g(b) = a$$

$$g(f(x)) = x$$

$$g'(f(x)) \cdot f'(x) = 1$$

$$g'(f(x)) = \frac{1}{f'(x)}$$

$$\text{let } x = a \Rightarrow f(a) = b$$

$$g'(b) = \frac{1}{f'(a)}$$