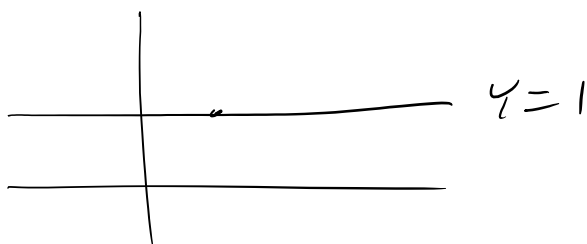


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③4 $y = \log_2 (x + x^{-1}) \quad x = 1$

$$\frac{d}{dx} \left(\frac{\ln (x + x^{-1})}{\ln 2} \right) = \frac{1}{\ln 2} \cdot \frac{d}{dx} (\ln (x + x^{-1})) \quad (1, 1)$$

$$\frac{1}{\ln 2} \cdot \frac{1}{x + x^{-1}} \cdot (1 - x^{-2}) = 0$$



(35) $f(x) = x^{2x}$ $y = x^{2x}$

$$\frac{d}{dx} (\ln y = \ln x^{2x} = 2x \ln x)$$

$$\frac{1}{y} \frac{dy}{dx} = 2 \ln x + 2$$

$$\frac{dy}{dx} = 2y (\ln x + 1)$$

$$= 2x^{2x} (\ln x + 1)$$

$$f(x) = x^{2x} = \left(e^{\ln x} \right)^{2x} = e^{2x \ln x}$$

$$\frac{d}{dx} e^{2x \ln x} = e^{2x \ln x} \cdot (2 \ln x + 2)$$

$$\left(e^{\ln x} \right)^{2x} (2 \ln x + 2) = x^{2x} (2 \ln x + 2)$$

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$$s(t) = 3^{7t} \quad t=2$$

$$s'(t) = 3^{7t} \cdot 7 \cdot \ln 3$$

$$= 3^{14} \cdot 7 \cdot \ln 3 \quad s(2) = 3^{14}$$

$$y - 3^{14} = 3^{14} \cdot 7 \cdot \ln 3 (t - 2)$$

$$(76) f(x) = x^{\cos x}$$

$$\frac{d}{dx} (\ln y = \ln x^{\cos x} = \cos x \ln x)$$

$$\frac{1}{y} \frac{dy}{dx} = -\sin x \ln x + \frac{\cos x}{x}$$

$$\frac{dy}{dx} = x^{\cos x} \left(\frac{\cos x}{x} - \sin x \ln x \right)$$