

$$\textcircled{9} f(x) = x^{1/3}$$

$$f'(x) = \frac{1}{3} x^{-2/3} = \frac{1}{3 \sqrt[3]{x^2}} = 0$$

$x=0$ is critical pt

($f'(0)$ DNE)

$$\textcircled{11} \quad f(x) = x \ln x$$

$$f'(x) = 1 \cdot \ln x + \frac{1}{x} \cdot x = \ln x + 1 = 0$$

$$\ln x = -1 \rightarrow e^{-1} = x \quad \text{is a critical point}$$

$$\textcircled{12} \quad f(x) = x e^{2x}$$

$$f'(x) = x \cdot e^{2x} \cdot 2 + e^{2x}$$

$$2x e^{2x} + e^{2x} = 0$$

$$e^{2x} (2x + 1) = 0$$

$$x = -\frac{1}{2}$$

$$(14) f(x) = \sec^{-1} x - \ln x$$

$$f'(x) = \frac{1}{|x|\sqrt{x^2-1}} - \frac{1}{x} = 0$$

where does $f'(x)$ not exist?

$$0, \pm 1$$

$$(1, \sqrt{2})$$

$$\frac{1}{|x|\sqrt{x^2-1}} = \frac{1}{x}$$

$$x = |x|\sqrt{x^2-1}$$

$$1 = \sqrt{x^2-1}$$

$$1 = x^2 - 1$$

$$2 = x^2 \quad x = \sqrt{2}$$

$$\cos \theta = 1$$

$$\cos^{-1} 1 = 0$$

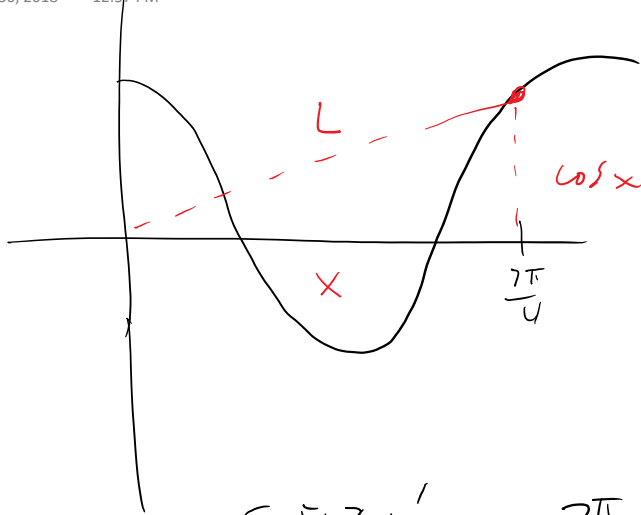
$$\sec 0 = \frac{1}{\cos 0} = 1$$

$$\sec^{-1} 1 = 0$$

Friday, November 30, 2018 12:55 PM

$$\frac{11}{6} - \frac{1}{4} = \frac{11}{6} - \frac{1}{4}$$

$$\left(\frac{11}{6}\right)^2$$



$$\frac{d}{dt} (x^2 + \cos^2 x = L^2)$$

$$2x x' + 2 \cos x (-\sin x) x' =$$

$$2LL'$$

$$L = \sqrt{\left(\frac{2\pi}{4}\right)^2 + \left(\frac{1}{\sqrt{2}}\right)^2} = 5.543$$

$$5.543 L' = \frac{2\pi}{4} x' + \frac{1}{\sqrt{2}} \cdot \frac{1}{\sqrt{2}} \cdot x'$$

$$= x' \left(\frac{2\pi}{4} + \frac{1}{2} \right)$$

$$L' = \frac{2 \left(\frac{2\pi}{4} + \frac{1}{2} \right)}{5.543}$$

$$5.543$$

$$y = 4^{\tan x}$$

$$y' \left(\frac{\pi}{6} \right)$$

$$\frac{dy}{dx} = 4^{\tan x} \cdot \ln 4 \cdot \sec^2 x$$

$$y = \frac{x^2}{\sin^{-1} x}$$

0.5

$$\frac{dy}{dx} = \frac{(\sin^{-1} x)(2x) - x^2 \left(\frac{1}{\sqrt{1-x^2}} \right)}{(\sin^{-1} x)^2}$$

$$= \frac{\frac{\pi}{6} - \frac{1}{4} \left(\frac{1}{\sqrt{1-\frac{1}{4}}} \right)}{\left(\frac{\pi}{6} \right)^2}$$