Good afternoon: warm up in notebooks

Find the derivative of y=ln(sec(x)). Simplify as much as you can.

$$y = \ln(\sec(x))$$

$$y' = \frac{1}{\sec(x)} \cdot \sec(x)\tan(x)$$

$$\boxed{y' = \tan(x)}$$

Reminders
- assessing
  Friday...finale??

Find the derivative of $y=\ln(\ln(\sin(x^2)))$

$$\frac{dy}{dx} = \frac{1}{\ln\sin(x^2)} \cdot \frac{1}{\sin(x^2)} \cdot \cos(x^2) \cdot 2x$$

$$\frac{2x}{\ln(\sin(x^2))} \cdot \cot(x^2)$$

$$\boxed{\frac{2x \cdot \cot(x^2)}{\ln(\sin(x^2))}}$$

A return to Differentiability...

NOTES

Why is $y = \sqrt[5]{3x}$ not differentiable at x=0?

✓ ① Continuity? yes, odd root.

$y = (3x)^{\frac{1}{5}}$

② Is y' continuous?

X

$y' = \frac{1}{5}(3x)^{-\frac{4}{5}} \cdot 3 \Rightarrow \frac{3}{5}(3x)^{-4/5}$

$y' = \frac{3}{5(3x)^{4/5}}$

f(x) is differentiable at x=c if

f(x) is continuous at x=c AND f '(x) is continuous at c

Show why each is nondifferentiable at x=0

$f(x) = \sqrt[3]{4x^2}$

$f(x) = (4x^2)^{\frac{1}{3}}$

$f'(x) = \frac{1}{3}(4x^2)^{-\frac{2}{3}} \cdot 8x$

$f'(x) = \frac{1 \cdot 8x}{3(4x^2)^{\frac{2}{3}}}$

$x \neq 0.$

$g(x) = -|x| + 5$

$g(x) = \begin{cases} -x+5, & x>0 \\ --x+5 \end{cases}$

$|x| = \begin{cases} x, & x \geq 0 \\ -x, & x<0 \end{cases}$

$g = \begin{cases} -x+5, & x \geq 0 \\ x+5, & x<0 \end{cases}$ cont ✓

$g' = \begin{cases} -1, & x>0 \\ 1, & x<0 \end{cases}$ cont ✗

Computer Lab!
Exploring derivatives graphically and algebraically

Head **quietly** to the library computer lab
Take all your stuff
Go to http://mcalc.weebly.com/lab

Do the 4 tasks in order, please

HW: practice assessment, real thing is Friday