Math 124 KAUST | Quiz 2 (20 minutes) | January 26, 2017

Name:

NOTE: This quiz is double sided! Answer the questions in the spaces provided. Show all necessary work. If you have any questions, raise your hand and I will come try to answer.

1. (20 points) In each of the following problems, compute $\frac{dy}{dx}$. You may have to use implicit differentiation, and/or logarithmic differentiation. There is no need to simplify.

   (a) (5 points)

$$y = e^{2x}\ln(\sin x).$$

$y' = 2e^{2x}\ln(\sin x) + e^{2x}\frac{\cos x}{\sin x}$

   (b) (5 points)

$$2y^3 + 3xy - x^5 = 40.$$

$6y^2y' + 3y + 3xy' - 5x^4 = 0$

product rule misuse on middle term. −2

$y'(6y^2+3x) = 5x^4 - 3y$

$y' = \frac{5x^4 - 3y}{6y^2+3x}$

forgot a y'

−1

(c) (5 points)

$y = x^{\sin x}$.

Method ~~case~~ 1

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

$\frac{y'}{y} = \cos x \ln x + \frac{\sin x}{x}$

$y' = (x^{\sin x})\left(\cos x \ln x + \frac{\sin x}{x}\right)$

Forgot to multiply by y?

-1

Method 2

$y = e^{\ln x \sin x}$

$y' = e^{\ln x \sin x}\left(\cos x \ln x + \frac{\sin x}{x}\right)$

(d) (5 points)

$y = \tan^{-1}\left(\tan^{-1}(x)\right)$.

$y' = \frac{1}{1+(\tan^{-1}x)^2} \cdot \frac{1}{1+x^2}$

not evaluated on inside:

-2?