Quiz on Derivatives

MATH 1110 - Amin Saied

Friday 14th, October

Name:

Net ID:

Section:

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1. State the definition of the derivative of a function $f(x)$. (2pts)

2. Compute the following derivatives using any tricks you know. (2pts each)

   (a) $f(x) = 3x^2 + 5x - 12$

   (b) $f(x) = 2e^4$

   (c) $f(x) = \sin(x) \cdot \ln(x)$

   (d) $f(x) = \ln(\cos(x))$

(e) $f(x) = \dfrac{e^x}{x}$

3. Let $f(x)$ be a function, a some real number, and h a variable. Decide what best represents the following expressions (delete as appropriate), and use a few of your own words to describe the expression given. (2pts each)

$f(x)$	Function/Number	
$f(a)$	Function/Number	
The slope of $f(x)$ at a	Function/Number	
The tangent line to $f(x)$ at a	Function/Number	
$f'(x)$	Function/Number	
$f'(a)$	Function/Number	
$\frac{f(x+h)-f(x)}{h}$	Function/Number	

4. True or false: $\frac{d}{dx}(\ln(\pi)) = \frac{1}{\pi}$. (2pts)

5. Using the chain rule, show that the derivative of $\ln(x)$ is $1/x$. That is, start with the composition

$$e^{\ln(x)=x}$$

and differentiate it using the chain rule. Do not use implicit differentiation, and do not use the formula for the derivative of the inverse function. (6pts)

6. By making reference to the graphs below, find the derivative of $y = e^{\cot(x)}$ at $x = \pi/4$, or explain how there isn't enough information to compute this. (6pts)