## Math 130 Day 17

Office Hours (LN 301/301.5): M 3:30-4:30, Tu 11:00-1:00, W 12:15-1:15, F 1:30-2:30. Other times by appointment. Math Intern: Sun through Thurs: 3:00-6:00, 7:00-10:00pm. Website: Use the links at the course homepage on Canvas or go to my course Webpage: http://math.hws.edu/~mitchell/Math130F16/index.html

## Homework

Today we develop the rule for the derivative of the product of differentiable functions and the derivative of $e^{k x}$ when $k$ is a positive integer. If we have time, we will consider quotients of differentiable functions.

Next time we begin to look at the derivatives of trig functions. And we will look at higher order derivatives (derivatives of derivatives!) Read/Review Chapter 3.4 and begin Chapter 3.5 through page 166.

1. 3-Minute QUIZ ON FRIDAY at the start of class. The limit definition of the derivative. 5-Minute QUIZ In $\mathbf{L A B}$ on using the derivative rules. Lab is a chance to practice these.
2. Practice: Page 160 ff $\# 5,6,9,11,13,17,39,41$ (divide through by $t^{3}$ to simplify), 45 , and 49 . Bonus: \#63 (Read about higher derivatives in the previous section.)

## Review: Trig Functions

This is the time to go back and read Chapter 1.4 on trig functions. This is the best thing you can do for yourself to get ready for trig derivatives.

## Hand In at Lab. Name:

$\qquad$
Proper Notation. Use proper mathematical grammar. Remember when taking derivatives NOT to write expressions such as $f(x)=6 x^{2}+2 x=12 x+2$. The original function is NOT the same as its derivative. What you mean is $f(x)=6 x^{2}+2 x$ and so $f^{\prime}(x)=12 x+2$ or $\frac{d}{d x}\left(6 x^{2}+2 x\right)=12 x+2$. (Most of you are doing a good job on this.)
0. Do WeBWork set Day 17. Due by Sunday night but they would be great practice for the Quiz.

1. For each, write out the answer in the form $\frac{d}{d x}[f(x)]=f^{\prime}(x)$. Page $160 \# 46$.
2. Page $160 \# 14$. Be sure to simplify your answer.
3. Page $160 \# 44$. Be sure to simplify your answer.
4. If we get to quotients: Page $160 \# 26$. Be sure to simplify your answer.
5. If we get to quotients: Determine the derivative of $f(t)=\frac{2 t^{4}+t}{e^{3 t}}$.
6. Look in the front of your text. Write out the Addition Formula for
a) $\sin (x+h)=$
b) and for $\cos (x+h)=$ $\qquad$
On Lab 5 last week (see online) you determined the following two limits. Fill in the values that you got.
c) $\lim _{x \rightarrow 0} \frac{\sin x}{x}=$ $\qquad$ d) $\lim _{x \rightarrow 0} \frac{1-\cos x}{x}=$
