## Math 1314 - ONLINE <br> Alternate Assignment 5

Record your answers to these questions on the Alternate Assignment 5 answer sheet and upload your answers to the Alternate 5 slot on the "Assignments" tab at casa.uh.edu. This assignment is due on Saturday, February 16, 2013, at 11:59 p.m. All work must be submitted electronically. Late work will not be accepted.

1. Write down the formula that gives the slope of the tangent line to the graph of a function $f$.
2. What is another name for the slope of the tangent line?
3. How does the average rate of change formula differ from the slope of the tangent line formula (limit definition)?
4. State the power rule, and use it to find the derivative of $f(x)=x^{7}$.
5. Find the derivative of each of these functions: $f(x)=7 x, g(x)=-9 x, h(x)=\frac{3}{2} x$. Then state a generalization for finding the derivative of any function of the form $f(x)=a x$.
6. Find the derivative of $f(x)=\frac{2}{3} x^{3}-\frac{5}{2} x^{2}+6 x-5$.
7. Find the derivative of $f(x)=3 x^{2}-6 x+8$. Then use it to find $f^{\prime}(-3)$.
8. Use GeoGebra to find $f^{\prime}(2.5)$ if $f(x)=\frac{2 x^{2}+5 e^{2 x}}{3 x^{2}+12}$.
9. Write an equation of the line that is tangent to $f(x)=2 x^{2}-3 x+5$ when $x=1$.
10. How do you find the rate at which a function is changing when $x=3$ ?
11. We typically rescale data given in years so that the numbers used for x are small. Suppose $t=0$ corresponds to the beginning of 2003. What value would you use for $t$ to represent the beginning of 2011?
12. How can you tell the difference between a "function value" problem and a "rate of change" problem?

Use this information to answer questions 13-18: Revenue realized from online sales can be modeled by the function $R(t)=0.0312 t^{3}+0.076 t^{2}+1.78 t+4.65$ where $R(t)$ is given in billions of dollars and $t$ is given in years since the beginning of 2000 .
13. Suppose you are asked to find the total revenue realized from online sales as of the beginning of 2010. Is this a function value, rate of change or average rate of change problem?
14. Find the total revenue realized from online sales as of the beginning of 2010.
15. Suppose you are asked what the average annual change in revenues from online sales was from the beginning of 2002 to the beginning of 2008. Is this a function value, rate of change or average rate of change problem?
16. Find the average annual change in revenues from online sales was from the beginning of 2002 to the beginning of 2008 .
17. Suppose you are asked to state how fast revenues from online sales were increasing at the beginning of 2007. Is this a function value, rate of change or average rate of change problem?
18. How fast were revenues from online sales increasing at the beginning of 2007

