**Math 3A Summary for Test 2**

1. Sketch the graph of a derivative of a function given the graph of the function. (Sec 2.8 #3-7odd only, don’t worry about the other problems from Sec 2.8)

* For differentiable functions at local maxima and minima ofthe tangent line is horizontal, so its slope
* is increasing:is positive.
* is decreasing:is negative.

2. Differentiation Rules - See Differentiation Rules Handout (Sec 3.1, 3.2, 3.3, 3.4)

* Memorize all the rules on the Differentiation Rules handout EXCEPT: 

3. Find equation of the tangent line to a function at a point. (Sec 3.1, 3.2, 3.3, 3.4, 3.5, 3.6)

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4. Implicit Differentiation (Sec 3.5)

I. Differentiate each term on both sides of the equation. When you differentiate an expression involvingbe sure to multiply by(because of the chain rule)!

II. Solve for.

5. Logarithmic Differentiation (Sec 3.6)

I. Take the ln of both sides and use the rules:

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II. Differentiate both sides of the equation using

III. Solve for.

6. Derivative = Instantaneous Rate of Change (Sec 3.7)

* For a position function, derivative=velocity
* For a cost function, derivative=marginal cost

7. Exponential Growth Function (Sec 3.8)

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8. The Second Derivative (Sec 3.1, 3.2)

* is the derivative of 
* Given position function =velocity and=acceleration

5% Bonus: Prove either the power rule, the product rule, or . I showed the proofs of the power and product rules in class. I will show the proof that  in class on Monday. You will choose just one of these three rules to prove.

\*There is no need to come to class on Monday, unless you have questions or want to see the proof that. Make sure you’re in class this Wednesday 3/21 for the test!