Weekly Assignment – Review for Exam 2

1. Use the algebraic definition of a derivative (forward difference quotient) to demonstrate that the power rule is true when
2. Use the algebraic definition of a derivative (forward difference quotient) to demonstrate that if then
3. Use the algebraic definition of a derivative (forward difference quotient) to demonstrate that (Note: sum of angle formulas and the values of required limits will be provided on the exam):
   1. If *h(x) = sin(x)* then *h’(x) = cos(x)*
   2. If *h(x) = cos(x)* then *h’(x) = -sin(x)*
4. Draw a diagram to justify geometrically that *f(a + h) = f(a) + hf’(a).* Make sure that your diagram includes the a, a+h, f(a), f(a+h), L(a+h), and most important the length associated with h\*f’(a)
   1. Use this result and the algebraic definition to justify the product and reciprocal rules.
5. Use the reciprocal or quotient rules for derivatives to verify the following formulas for the derivatives of other trig functions:
   1. If *f(x) = tan(x)* then
   2. If *f(x) = cot(x)* then
   3. If *f(x) = sec(x)* then *f’(x)= sec(x)tan(x)*
   4. If *f(x) = csc(x)* then *f’(x)= -csc(x)cot(x)*
6. Use implicit Differentiation to justify the following derivatives showing all of your steps
7. Find *y’* for each of the following
8. Find the tangent line to when *x* = 0 and use it to approximate *f(0.3)*.
9. Given the graph of *f* shown below, sketch the graph of *f’.*

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1. For the functions A-B below,
2. Find the formula of f’ and f’’.
3. Find the values of x where f’ and f’’ are equal to zero.
4. Create a numberline with the signs of f’ and f’’ as done in class
5. Find the points of inflection, local and global maxima and minima
6. Draw the graph of *f* on the interval labeling local and global max/min and pts of inflection. (feel free to check with Desmos)
7. on [-2,2]
8. on [0,2pi]