Math 1071 - Calculus for Business and Economics
Name:

Quiz 5.5
Spring 2018

Section:

Follow the instructions in each problem.
Show supporting work, not just a final answer, to receive credit on a problem.

1. (**5 pts**) Let $f(x) = x^2 + 1$

   (a) Find the average rate of change on the interval $[1, 4]$.

$$= \frac{f(4) - f(1)}{4-1} = \frac{(4^2+1) - (1^2+1)}{3} = \frac{15}{3} = 5$$

   (b) Find $f'(x)$ using the limit definition of derivative.

$$f'(x) = \lim_{h\to 0} \frac{f(x+h) - f(x)}{h} = \lim_{h\to 0} \frac{[(x+h)^2+1] - [x^2+1]}{h}$$

$$= \lim_{h\to 0} \frac{x^2+2xh+h^2+1-x^2-1}{h}$$

$$= 2x$$

2. (**5 pts**) Below is the graph of a function $f(x)$. Use it to sketch the graph of the derivative.