

Fall 2013
Kronenthal

MAT 181-050
Section 3.1
Supplemental Graded Homework Problem

In this problem, we will answer the following question:

Where is $f(x) = |x|$ differentiable?

To do this, answer the following questions. Be sure to show all work and completely justify your answers.

1. Using the limit definition of the derivative, calculate $f'(x)$ when $x > 0$ (if it exists).
2. Using the limit definition of the derivative, calculate $f'(x)$ when $x < 0$ (if it exists).
3. Using the limit definition of the derivative, calculate $f'(0)$ (if it exists).
4. Based on the above information, where is $f(x) = |x|$ differentiable?