Recitation 01: Secant Lines

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Class Information

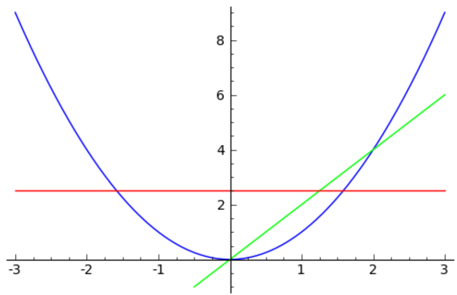
Format of the class: I will have a mini-lecture for the first 10 minutes or so, then you will split into groups and work on the assigned problems. Assigned problems are due at the beginning of the next recitation class period.
Materials: MAT 270 Recitation Booklet. Unless otherwise stated, all of your problems will come from this book.
Attendance: Attendance is expected as this is still part of your MAT 270 grade. I will be taking attendance at various times throughout the period, so please stay for the whole thing. If you finish early, assist other groups.
Late Work: Per Dr. Boerner, late work will not be accepted. I still encourage you do to the problems, however, to solidify the material.
Website: I will be posting the problems and solutions on my website, *math.joedub.net*, under the Teaching tab. If you are absent, you are not exempt from the assignment. You are still expected to turn it in on the due date.
Grading: Each assignment is going to be worth 10 points. *For the most part*, we will be grading 5 of the assigned problems and assigning 1 point for correct work, and 1 point for a correct answer. These are all or nothing points, so if you end up with the correct

answer but your work is incorrect, you will only receive 1 point. Showing your work is crucial in mathematics, so we have to grade accordingly.

Secant Lines

What is a secant line? It's a line drawn between any two points on a curve. What does it tell us? The slope tells us the average rate of change between two points.

Let's consider the function $f(t) = t^2$.



The blue drawing is the graph of our function. The green secant line is our average rate of change over the interval $[0, 2]$. The red secant line is the average rate of change over the interval $[-a, a]$ for some arbitrary real number a. What do we notice about the red secant line? It looks to have a zero slope. How can we verify this? We have a formula for that:

$$\text{slope} = \frac{f(t_2) - f(t_1)}{t_2 - t_1}$$

So we can verify analytically that

$$\text{slope} = \frac{f(a) - f(-a)}{a - (-a)} = \frac{(a)^2 - (-a)^2}{a + a} = \frac{0}{2a} = 0.$$

Assignment

MAT270 Recitation Notebook
§2.1, Problems 1-6