

MATH 111: MIDTERM REVIEW QUESTIONS

There are meant to be relatively easy problems which highlight essential ideas from the most-requested review topics. Problems on the exam might be a bit harder!

Problem 1. Let $f(x) = -2|x| + 3$. Guess the value of

$$\lim_{x \rightarrow -1} f(x)$$

and write an ε - δ proof showing that your guess is correct.

Problem 2. An equilateral triangle expands in such a manner that its area increases at a constant rate of $1 \text{ cm}^2/\text{s}$. Compute the rate of change of the triangle's altitude and side length when the area of the triangle measures $\sqrt{3} \text{ cm}^2$.

Problem 3. Consider the function $f(x) = \sin(x) + \cos(x)$ on the closed interval $[-2\pi, 2\pi]$. Find its local and global extrema. Sketch its graph.

A tip. Interpretations of the derivative are important. We covered three, and it would be good to know and know how to use all of them: slope of tangent line, rate of change, linear approximation.

Office hours. My pre-exam office hours are today 1:30-3:30P.M. (extended!) and Thursday 1:30-2:30P.M..

Date: 15.X.14.