Math 121 Exam 1 Topics

Exam 1 covers the following topics:

1. Function Models. Given a verbal description of input versus output, find the formula for $f(x)$ and describe its domain. See for example Quiz 1 and problems 45-49, Section 1.1.

2. Composition of Functions. Given $f(x)$ and $g(x)$, find $f \circ g(x)$ and $g \circ f(x)$. Also, given $h(x)$, find $f(x)$ and $g(x)$ so that $h(x) = f \circ g(x)$. See problems 37-42 and 45-48, Section 1.2.

3. Limits of Functions. Prove that $\lim_{x \to a} f(x) = L$ using an ϵ-δ argument. Just study the linear examples that we considered in class and find a formula for δ in terms of ϵ.

4. Calculating Limits using Limit Properties. Find $\lim_{x \to a} f(x)$ using limit properties. You should be familiar with the techniques in Examples 4, 5, 9, and 10, Section 1.4. See also problems 17, 21, 31, and 43–48, Section 1.4.

5. Continuity and the Intermediate Value Theorem. Use the Intermediate Value Theorem to show that the equation $f(x) = N$ has a solution x between a and b. See the statement of the IVT on page 52 (Theorem 9), see Example 8, and make sure you can do problems 37–42, Section 1.5.