Calculus 1 — Outline for Exam 2

Main ideas

A. Definition of the derivative

B. Derivative rules including product, quotient, and chain (composition)

C. Derivative formulas for power, trigonometric, inverse trig., exponential, and logarithmic functions:

$$x^n,\ e^x,\ a^x,\ \ln x,\ \log_a x,\ \sin(x),\ \cos(x),\ \tan(x),\ \sec(x),\ \arcsin(x),\ \arctan(x),\ \operatorname{arcsec}(x)$$

D. Implicit differentiation

E. Interpreting derivatives: tangent lines, velocity, and acceleration.

Skills you should have

1. Be able to compute the derivative using the definition of the derivative; that is, using $\lim_{h\to 0} \dfrac{f(x+h)-f(x)}{h}$ instead of the derivative rules

2. Be able to compute derivatives using the various derivative rules and formulas

3. Be able to compute derivatives of implicitly defined functions, e.g. $\sin(xy) = x^2 + e^y$

4. Be able to use the graph of $f(x)$ to estimate and sketch $f'(x)$ (using slopes)

5. Be able to find tangent lines

6. Be able to answer questions about velocity and acceleration given a position function

How to study

I. Review core topics

II. Work *lots* of problems all of the way through—focus on WeBWorK problems and Worksheet problems

III. Practice doing several problems in a short amount of time (by timing yourself)

IV. Come talk with me if you have any questions