

Topics for Final Exam Math 30, Fall 2004

The final exam will be comprehensive, and will therefore involve both the topics on this sheet and **all previous topics**. There will be a slight emphasis on the topics listed here, but everything we have covered is fair game.

Your first priority should be to understand the homework and the principles behind it. Besides the list below, you should also be familiar with everything specially emphasized in the text (i.e., the red boxes), and all the examples in the text. If time permits, try to do the example problems in the text by yourself.

Section 4.2. The Mean Value Theorem: What it says; what it means; picture. How MVT implies THE BOX. The Zero Derivative Theorem (p. 293).

Section 4.7. Idea of optimization. Steps in solving optimization problems (pp. 331–332). Using f' to find *absolute* min/max (especially when Closed Interval Method doesn't work). Problems.

Section 4.10. Definition of antiderivative; how “most general antiderivative” works; basic antidifferentiation formulas. Acceleration, velocity, position: word problems.

Geometry formulas. Area of rectangle, circle, triangle. Circumference of circle, perimeter of rectangle. Surface area of sphere, side of cylinder. Volume of box, sphere, cylinder. Trig: Pythagorean Theorem, SOHCAHTOA. Solving $\sin x = a$, $\cos x = b$.

Not on exam. Section 4.2: Rolle's Theorem; all proofs. Section 4.9: all. Section 4.10: direction fields.

Old stuff not on exam. Section 2.4. (The idea of the definition of the limit is fair game; only the precise ϵ - δ version will not be covered.)