Announcements

- Homework 10 and 11 due this Friday, 11/16.
- Extra office hours this week:
  - Thursday 12:30 to 2:00
  - Friday 10:00 to 11:30
- Exam 3 will be **Monday 11/19/2007**:
  - Covers sections 3.8, 4.1 through 4.6, and 5.1 (not 4.7)
- Today we'll review (and expand on) material from 4.5, 4.6, and 4.7. (L'Hôpital and optimization).

L'Hôpital examples

- Check if form of answer is indeterminate, e.g.,

$$1^{\infty}, \qquad 0^0, \qquad \infty^0, \qquad \infty - \infty, \qquad 0 \cdot \infty$$

- Convert to the form needed by L'Hôpital: $\frac{0}{0}$, $\frac{\infty}{\infty}$ and apply L'Hôpital (possibly multiple times).
- A common trick when you have a function to a power that is also a function of x is to take logarithm first, then try limit (similar to idea is logarithmic differentiation).

Optimization General process:

1. Draw a picture.
2. Decide what quantity is to be optimized (maximized or minimized). Write a mathematical formula for the quantity.
3. Use constraints and conditions to eliminate variables. We need to get the formula to a single variable to optimize with the technology we know.
4. Find other constraints that come from practical facts (e.g., lengths need to be positive).
5. Use calculus methods to find max or min. (subject to given constraints).