Warm-up Problems - February 6, 2006

1. Find the area between the x-axis and $y = \ln x$ for $1 \leq x \leq e$.

2. For an income stream, rank the following in order of smaller to largest.
   (a) Future value of the income stream
   (b) Present value of the income stream

3. A random variable, X, has pdf:'

$$f(x) = \begin{cases} 0 & \text{if } x < 0 \\ \frac{2}{(x+1)^3} & \text{if } x \geq 0 \end{cases}$$

   Find the probability that $X < 0.5$.

Lecture Problems

4. For the functions below, find all critical points ($f_x = 0, f_y = 0$).
   (a) $f(x, y) = x^2 - y^2 + 2x + 6y - 4$
   (b) $f(x, y) = 16xy - x^4 - 2y^2$