Math 165: Honors Calculus I
Assignment 11 *Sept. 23, 1998*

1. Let $A = \left\{ 1 + \frac{1}{n} - \frac{1}{m} \mid n, m \in \right\}$. Prove that $\sup A = 2$ and $\inf A = 0$.

2. Define
$$f(x) = \begin{cases} 0 & \text{if } x = 1/n \text{ for some } n \in \\ 1 & \text{otherwise} \end{cases}$$
Prove or disprove that $f(x)$ is integrable on $[0, 1]$.

3. Use Theorem 1.14 to find an approximation to the integral $\int_1^2 \frac{1}{x}\, dx$ so that the error is $< .05$. You may use a claculator or computer, but you must prove the accuracy of your approximation.