Homework 6
Due Tuesday 4/5/2011 in discussion section

Name: **Section Number:**

This cover sheet must be attached as the top page of your homework.

1. Evaluate the following limits:

   (a)

   $$\lim_{x\to\infty} \frac{x^2+x}{x^3+1}$$

   (b)

   $$\lim_{x\to 0} (e^x - 1 - x)^x$$

2. Use L'Hopital's rule to determine any horizontal asymptotes of the following functions:

   (a)

   $$f(x) = \frac{\ln x^5}{x^{0.02}}$$

   (b)

   $$g(x) = \left(\frac{2x+3}{x-1}\right)^x$$

3. A forest ranger is in a forest 2 miles from a straight road. A car is located 5 miles down the road. If the forest ranger can walk 3 miles per hour in the forest and 4 miles per hour along the road, toward what point on the road should the ranger walk in order to minimize the time needed to reach the car?

4. The highway department is planning to build a rectangular picnic area along a major highway. It is to have an area of 5000 yds^2 and is to be fenced off on the three sides not adjacent to the highway. What is the least amount of fencing that will be needed to complete the job?