Homework 2 - Math 1451-008 (Howle)
Due Wednesday 2/15/2012 in class

Name: **R Number:**

This cover sheet must be attached as the top page of your homework.
See homework requirements in the syllabus.

1. Prove using the formal definition of the limit (that is, do an epsilon-delta proof) that

$$\lim_{x \to 2} 5x - 7 = 3.$$

2. Evaluate the limit:

$$\lim_{x \to 0} \frac{x^2 \cos x}{\cos x - 1}.$$

For this problem, do **not** use l'hopital's rule even if you know it. And if you don't know what l'hopital's rule is , don't worry, we'll do it soon. (Hint: multiply by "a clever choice of 1".)

3. Show that the equation

$$x + \sin x = \frac{1}{\sqrt{x} + 3}$$

has at least one solution on the interval $(0, \pi)$. Clearly write out any theorem you are using and be sure to show that the requirements of the theorem are met for this problem.