Math 1B, Quiz 5

Monday, March 2

1. (1 pt each) Decide whether each of the following **series** is convergent or divergent. You DO NOT have to show your work.

   (a) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n}$

   (b) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n^2}$

   (c) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{\sqrt{n}}$

   (d) $\displaystyle\sum_{n=1}^{\infty} \frac{3+5^n}{n^2+7^n}$

   (e) $\displaystyle\sum_{n=1}^{\infty} \frac{\ln(n+1)+\sqrt{n^3+4}}{n^2+5\sin(n^2)}$

   (f) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n} - \frac{1}{n+\pi}$

2. TRUE OR FALSE (2 pts each). You DO NOT have to show your reasoning if the answer is true. If the answer is false, provide a counterexample.

   (a) If a_n, b_n are sequences with positive terms and $\lim_{n\to\infty} a_n/b_n = 0$ then $\sum_{n=1}^{\infty} a_n$ converges.

   (b) If $a_n > 0$ and $\sum_{n=1}^{\infty} a_n$ is convergent then $\sum_{n=1}^{\infty} a_n^2$ is convergent.

3. (3 pts) Determine whether the series $\displaystyle\sum_{n=1}^{\infty} \frac{\ln n}{n^{1.3}}$ converges or diverges. Show all of your work.

Extra Credit

Write the fraction $\frac{100}{97}$ in decimal form to as many decimal places as you can (hint: put it in the form $\frac{1}{1-x}$). ($\frac{1}{4n}$ pts for the n-th digit)