Math 1B, Quiz 4

Monday, February 23

1. (1 pt each) Decide whether each of the following **sequences** is convergent or divergent. If the sequence is convergent, find the limit.

   (a) $\lim_{n\to\infty} \dfrac{25^n}{n!}$

   (b) $\lim_{n\to\infty} \dfrac{1.1^n}{n^{1.1}}$

   (c) $\lim_{n\to\infty} \dfrac{\sin n}{n}$

   (d) $\lim_{n\to\infty} \sin n$

   (e) $\lim_{n\to\infty} \dfrac{(\ln n)^3}{n^{1/3}}$

   (f) $\lim_{n\to\infty} \dfrac{n^2 + \ln n}{3n^2 + 2n + \sqrt{n}}$

2. (3 pts) Find the limit of the sequence $\lim_{n\to\infty} \sqrt{n^2 + 3n + 1} - n$.

3. (3 pts) Find the sum of the series $\sum_{n=1}^{\infty} \dfrac{5}{7^n}$.

Extra Credit

Mark all statements as true or false (0.1 pt each). Answers will be judged based on their consistency with your other answers rather than according to a theoretical "correct" solution.

1. The sum of the numbers of the true statements is equal to the sum of the numbers of the false statements.
2. All prime-numbered statements are true.
3. The product of the numbers of the false statements is 10.
4. The sum of the numbers of the true statements is prime.
5. All even-numbered statements are false.