YAPS: Yet Another Problem Set, Comparison Tests

The following are questions/issues to help you to organize your thoughts. The answers are to be found by looking at the work we did in class.

1) When you answer the question, 'does $\sum \frac{1}{\sqrt{k}}$ converge or diverge' the answer has four parts. What are those parts?

2) If you’re using the comparison test on $\sum a_k$ and you believe the sum converges, what inequality do you have to show?

3) If you’re using the comparison test on $\sum a_k$ and you believe the sum diverges, what inequality do you have to show?

4) When you use the limit comparison test, and you compute $\lim \frac{a_k}{b_k} = L$, what is the next thing you have to show?

5) For which of the following is the limit comparison test good, and for which is it not good?

   a) $\sum \frac{k + \ln k}{k^2 + 1}$  
   b) $\sum \frac{\ln k}{k^2}$  
   c) $\sum \frac{1}{k^2 e^k}$  
   
   d) $\sum \frac{k^3 + k^2 + 1}{k^4 - k^3 - k}$  
   e) $\sum \frac{k}{2^k}$  
   f) $\sum \frac{1}{k^2 + e^k}$