MATH 230
11.4

Directions: Show all work on a separate sheet of paper for full credit.

1. Suppose that $\sum a_n$ and $\sum b_n$ are series with positive terms and $\sum b_n$ is convergent.
   (a) If $a_n > b_n$ for all n, what can you say about $\sum a_n$? Why?
   (b) If $a_n < b_n$ for all n, what can you say about $\sum a_n$? Why?
2. Suppose that $\sum a_n$ and $\sum b_n$ are series with positive terms and $\sum b_n$ is divergent.
   (a) If $a_n > b_n$ for all n, what can you say about $\sum a_n$? Why?
   (b) If $a_n < b_n$ for all n, what can you say about $\sum a_n$? Why?
3. Determine whether the series converges or diverges.
   (a) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n^3+8}$
   (b) $\displaystyle\sum_{n=2}^{\infty} \frac{1}{\sqrt{n}-1}$
   (c) $\displaystyle\sum_{n=1}^{\infty} \frac{6^n}{5^n-1}$
   (d) $\displaystyle\sum_{n=1}^{\infty} \frac{9^n}{3+10^n}$
   (e) $\displaystyle\sum_{k=1}^{\infty} \frac{\ln(k)}{k}$
   (f) $\displaystyle\sum_{n=1}^{\infty} \frac{n\sin^2(n)}{1+n^3}$
   (g) $\displaystyle\sum_{n=1}^{\infty} \frac{n+1}{n^3+n}$
   (h) $\displaystyle\sum_{n=2}^{\infty} \frac{1}{n\sqrt{n^2-1}}$
   (i) $\displaystyle\sum_{n=1}^{\infty} \frac{n+3^n}{n+2^n}$
   (j) $\displaystyle\sum_{n=1}^{\infty} \frac{e^n+1}{ne^n+1}$
   (k) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n^n}$
   (l) $\displaystyle\sum_{n=1}^{\infty} \frac{5+2n}{(1+n^2)^2}$