Math 6B(1) Homework #3

Due in class Friday, Sept. 19.

1. Do these problems from the handout: §2.3 (p. 33) #1-4; §3.1 (p. 41) #3, 6; §4.1 (p. 48) #4a-d, 7.

2. Investigate each of the following series for convergence.

(a) $\sum \frac{1}{(2n-1)^2}$ (b) $\sum \frac{1}{n^2-8}$ (c) $\sum \frac{1}{\sqrt{n(n+2)}}$ (d) $\sum \frac{1}{\ln n}$ (e) $\sum \frac{2^n}{3^n-1000}$ (f) $\sum \left(\frac{n+1}{2n}\right)^n$

3. If $\sum a_n$ is a convergent series of positive terms, why does it follow that the series $\sum a_n^2$ converges?

4. A p-series has the form

$$\sum \frac{1}{n^p}.$$

(a) Explain why the p-series diverges if $p \leq 1$.
(b) Explain why the p-series converges if $p \geq 2$.
(c) What do you think happens if $1 < p < 2$?