Math 131A Section 6: Homework 5, Due 5/13 in TA session

1. Find the range of p for which the series $\Sigma_{n=1}^{\infty}\dfrac{1}{n(\ln n)^p}$ is convergent. Do Not use the integral test.

2.

(a) Let (a_n) be a non-increasing sequence. Show that if Σa_n converges then so does $\Sigma(a_n)^3$.

(b) Show that if Σa_n absolutely converges and (b_n) is a convergent sequence, then $\Sigma(a_n b_n)$ absolutely converges.

3. Let $f : [0,1] \to \mathbb{R}$ be continuous. Show that the range of f,

$$f([0,1]) = \{y : y = f(x) \text{ for some } 0 \le x \le 1\},$$

is closed.

4-7. 14.4, 14.12, 15.6., 15.7.
8-11. 17.7, 17.8, 17.10, 17.12.