Exam 2

1. Determine convergence/divergence. Indicate which test(s) you are using.

(a)

$$\sum_{k=2}^{\infty} \frac{5k\sqrt{k}}{7k^2+5k+1}$$

(b)

$$\sum_{k=1}^{\infty} \frac{(-1)^k}{\sqrt[3]{2k+11}}$$

(c)

$$\sum_{k=1}^{\infty} \left[\frac{7}{4} - \frac{\sqrt[k]{4}}{3} \right]^k$$

(d)

$$\sum_{k=2}^{\infty} \frac{7k}{k^3 - 1}$$

(e)

$$\sum_{k=0}^{\infty} \frac{7^k}{(2k)!}$$

2. Prove the following statement:

$$\text{If } \sum a_n \text{ converges, then } \lim_{n \to +\infty} a_n = 0$$

3. Find the value of the convergent series below:

(a)

$$\sum_{k=1}^{+\infty} \frac{3^{k+1}}{5^{k-1}}$$

(b) Hint: Write out some partial sums and then take the limit of the k^{th} partial sum.

$$\sum_{k=1}^{+\infty} \frac{2}{n(n+1)}$$

4. Give three examples (each) of . . .

(a) divergent alternating series

(b) a conditionally convergent alternating series.

(c) an absolutely convergent alternating series

(d) a decreasing *sequence* that converges to 7.

(e) a strictly increasing *sequence* that converges to π.

Scratchwork