

Exam 2 Guide

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

(a)

$$\sum_{k=0}^{\infty} \frac{(-1)^n}{2n}$$

(b)

$$\sum_{k=2}^{\infty} \frac{2k\sqrt[3]{k}}{3k^2 + 5k + 1}$$

(c)

$$\sum_{k=1}^{\infty} \cos\left(\frac{1}{k^2}\right)$$

(d)

$$\sum_{k=1}^{\infty} \left[\frac{8}{5} - \frac{\sqrt[5]{5}}{2} \right]^k$$

(e)

$$\sum_{k=2}^{\infty} \frac{7k}{k^3 + 17}$$

(f)

$$\sum_{k=0}^{\infty} \frac{5^{3k}}{(2k)!}$$

(g)

$$\sum_{k=1}^{\infty} \sin\left(\frac{1}{k}\right)$$

2. Prove the following statement:

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

3. Find the value of the convergent series below:

(a)

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

(b)

$$\sum_{k=2}^{+\infty} [64^{1/k} - 64^{1/(k+2)}]$$

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

(a) a divergent alternating series

(b) a conditionally convergent alternating series.

(c) an absolutely convergent alternating series

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

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

Scratchwork