

Answers to Week in Review 8

1. a.) Diverges by the Test for Divergence
- b.) Diverges by integral test
- c.) Converges by integral test.
- d.) Converges by comparison test, limit comparison test, or integral test
- e.) Diverges by comparison test or limit comparison test
- f.) Converges by limit comparison test
- g.) Converges by comparison test or limit comparison test
- h.) Converges by comparison test

2.  $S_{10} \approx 1.082036583$ ,  $R_{10} < \frac{1}{3000}$

3.  $n > e^{10/\sqrt[3]{3}}$ , thus  $n$  must be at least 1027

4. a.) The series converges but not absolutely.
- b.) The series converges absolutely.
- c.) The series diverges by Test for Divergence
- d.) The series converges absolutely by the Ratio Test.
- e.) The series converges absolutely by the Ratio Test.

4. Converges absolutely by Ratio Test;

$$S_2 = \frac{(-1)^0}{1!} + \frac{(-1)^1}{3!} + \frac{(-1)^2}{5!}$$

$$|R_2| \leq \frac{1}{7!}$$

5. Approximate the series with the 9th partial sum:

$$S_9 = -1 + \frac{1}{4} - \frac{1}{9} + \frac{1}{16} + \dots - \frac{1}{81}$$

6.  $-\frac{1}{4}$