

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