1. What is an alternating series? When can you say an alternating series converges?

2. How can you estimate the sum of an alternating series?

3. What does it mean to say a series converges absolutely?

4. What does it mean to say a series converges conditionally? Give an example of a conditionally convergent series.

5-14. Determine whether the following series converge absolutely, converge conditionally, or diverge.

5. \[ \sum_{n=1}^{\infty} \frac{(-1)^n n}{2n^2 + 1} \]
6. \[ \sum_{n=1}^{\infty} \frac{(-1)^n n}{5^n + 1} \]
7. \[ \sum_{n=1}^{\infty} \frac{(-1)^n n^3}{5n^3 + n^2} \]
8. \[ \sum_{t=2}^{\infty} \frac{(-1)^t \ln t}{t} \]
9. \[ \sum_{n=1}^{\infty} \frac{\cos(n\pi)}{\sqrt{5n^4 + n}} \]
10. \[ \sum_{n=2}^{\infty} \frac{(-1)^n 10^n}{n!} \]
11. \[ \sum_{n=1}^{\infty} \frac{(-1)^n e^{1/n}}{n} \]
12. \[ \sum_{n=1}^{\infty} \frac{(-1)^n n^n}{n!} \]
13. \[ \sum_{n=1}^{\infty} (-1)^n \sin(\pi/n) \]
14. \[ \sum_{n=1}^{\infty} (-1)^n (\sqrt{n + 1} - n) \]

15-18. Estimate the sum of the series with the stated accuracy.

15. \[ \sum_{n=1}^{\infty} \frac{(-1)^n}{n^2} \] error less than \(10^{-3}\).
16. \[ \sum_{n=1}^{\infty} \frac{(-1)^n (1/\sqrt{3})^{2n-1}}{2n - 1} \] error less than \(10^{-4}\).
17. \[ \sum_{n=1}^{\infty} \frac{(-1)^n}{n!} \] error less than \(10^{-6}\).
18. \[ \sum_{n=1}^{\infty} \frac{(-1)^{n+1}(1/2)^n}{n} \] error less than \(10^{-3}\).

19. Which of the following statements are true and which are false?
   a) All alternating series converge.
   b) If a series converges absolutely, then it converges.
   c) Conditionally convergent series never converge absolutely.
   d) If the terms of a series \( a_n \to 0 \) as \( n \to \infty \), then the series \( \sum a_n \) converges.