

Determine whether the infinite series in Exercises 1 through 25 converge absolutely, converge conditionally, or diverge. Justify your answers.

1. $\sum_{j=0}^{\infty} (-1)^j \frac{j+2}{j^3+6}$

2. $\sum_{j=1}^{\infty} \frac{\sin j}{j^3+1}$

3. $\sum_{k=0}^{\infty} \frac{k^2}{\sqrt{k^5+7}}$

4. $\sum_{m=1}^{\infty} \left(\frac{m^2+1}{m^3-3m+4} \right)^4$

5. $\sum_{n=0}^{\infty} (-1)^n \sqrt{\frac{14}{n+15}}$

6. $\sum_{j=2}^{\infty} \frac{1}{j\sqrt{\ln j}}$

7. $\sum_{j=2}^{\infty} \frac{(-1)^j}{j(\ln j)^{4/3}}$

8. $\sum_{j=2}^{\infty} \frac{1}{\ln(\ln j)}$

9. $\sum_{j=2}^{\infty} \frac{(-1)^j}{\ln(\ln j)}$

10. $\sum_{j=0}^{\infty} \frac{j^3}{4^j}$

11. $\sum_{j=1}^{\infty} \left(\frac{-10}{j} \right)^j$

12. $\sum_{j=0}^{\infty} \left(\frac{-j}{10} \right)^j$

13. $\sum_{n=1}^{\infty} (-1)^n \frac{n!}{n^n}$

14. $\sum_{k=1}^{\infty} \frac{\cos(3^k)}{k^{1.3}}$

15. $\sum_{j=1}^{\infty} j^{10} \left(\frac{9}{10} \right)^j$

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

17. $\sum_{n=4}^{\infty} \frac{(-1)^{n-1}}{\sqrt[n]{n^5-1000}}$

18. $\sum_{j=2}^{\infty} (-1)^j \frac{\ln j}{j}$

19. $\sum_{m=1}^{\infty} \sqrt{\arctan m}$

20. $\sum_{m=1}^{\infty} \frac{(-1)^m}{\arctan m}$

21. $\sum_{j=1}^{\infty} \left(\frac{2j}{3-4j} \right)^j$

22. $\sum_{k=1}^{\infty} (-1)^{k+1} \frac{k+1}{k+2}$

23. $\sum_{k=1}^{\infty} \frac{1}{1+e^k}$

24. $\sum_{k=1}^{\infty} \frac{1}{1-e^{-k}}$

25. $\sum_{j=2}^{\infty} \frac{1}{j^2 \ln j}$

1. AC
2. AC
3. D
4. C
5. CC
6. D
7. AC
8. D
9. CC
10. C
11. AC
12. D
13. AC
14. AC
15. C
16. AC
17. AC
18. CC
19. D
20. D
21. AC
22. D
23. C
24. D
25. C