List of tests we’ve learned:

1. Divergence test
2. Integral test
3. Comparison test (including limit comparison test and the modified limit comparison test)
4. Alternating series test
5. Absolute convergence test
6. Ratio test
7. Root test
Strategy for testing series

List of standard series:

1. $p$-series (including harmonic series) converges if and only if $p > 1$

2. geometric series convergence if and only if $|r| < 1$
Example. (problem 19 on page 746.)

$$\sum_{n=1}^{\infty} (-1)^n \frac{\ln n}{\sqrt{n}}$$

Solution: Alternating series test
Example. (problem 20 on page 746)

\[
\sum_{k=1}^{\infty} \frac{3 \sqrt{k} - 1}{k(\sqrt{k} + 1)}
\]

Solution: Limit comparison test
Example. (problem 21 on page 746)

\[ \sum_{n=1}^{\infty} (-1)^n \cos \frac{1}{n^2} \]

Solution: Divergence test
Example. (problem 22 on page 746)

\[ \sum_{k=1}^{\infty} \frac{1}{2 + \sin k} \]

Solution: Divergence test
Example. (problem 23 on page 746)

\[ \sum_{n=1}^{\infty} \tan\left(\frac{1}{n}\right) \]

Solution: Limit comparison test
Strategy for testing series

Example. (problem 24 on page 746)

\[
\sum_{n=1}^{\infty} n \sin\left(\frac{1}{n}\right)
\]

Solution: Divergence test