

1. Find the sum of the series $\sum_{k=1}^{\infty} \frac{(-1)^k}{3^k}$.

2. State a conclusion about the convergence of the series $\sum_{n=2}^{\infty} \frac{5}{2n\sqrt{n^3-4}}$ and justify that conclusion using a comparison argument.

3. Use the ratio test to reach a conclusion about the convergence of the series $\sum_k \frac{k3^k}{k!}$.