

1. Does $\sum_{n=1}^{\infty} (-1)^n \frac{1}{\sqrt[n]{n}}$ converge or diverge?

2. Does $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{n^2}{n^3+1}$ converge or diverge?

Challenge: Show by example that $\sum a_n b_n$ may diverge even if $\sum a_n$ and $\sum b_n$ both converge.

Q: What is harder to catch the faster you run?