Solutions

Each answer shows the steps, then the **result**.

2.1

- Yes — $\sum \frac{1}{n^2}$ is a convergent p-series

2.2

- Absolutely convergent

2.3

- $\sum \frac{1}{n}$ diverges; so $\sum \frac{(-1)^n}{n}$ is **conditionally** convergent

3.1 B

- converges, but not absolutely

3.2

(a)

- $\sum \frac{1}{\sqrt{n}}$ is a p-series with $p = \frac{1}{2} \leq 1$, diverges

(b)

- Alternating series test: $b_n = \frac{1}{\sqrt{n}}$ decreasing $\to 0$, so it converges

(c)

- Conditionally convergent

3.3

- Absolute convergence guarantees the series converges no matter how the terms are arranged, and it implies ordinary convergence; conditional convergence depends on the sign pattern and can be broken by rearrangement