

Solutions

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

2.1

- $\frac{2n}{3n+1} \rightarrow \frac{2}{3}$

2.2

- Diverges — the limit is $\frac{2}{3} \neq 0$, so by the n th term test it diverges

2.3

- No — the test is inconclusive when the terms go to 0

3.1 C

- the test is inconclusive when $a_n \rightarrow 0$

3.2

(a)

- $\frac{n^2}{2n^2+5} \rightarrow \frac{1}{2}$

(b)

- Limit $\neq 0$, so the series **diverges**

3.3

- The n th term test only detects **divergence**; $a_n \rightarrow 0$ does not prove convergence (in fact $\sum \frac{1}{\sqrt{n}}$ is a p -series with $p = \frac{1}{2} \leq 1$ and diverges)