Values

10   1. Find limits for the following sequences, if they exist.

(a) $\left\{ \left(\dfrac{n+1}{n} \right)^n \left(\dfrac{n^2}{2n^2+1} \right) \right\}$ (b) $\left\{ \dfrac{2^n + \text{Cot}^{-1} n}{3(2^n + 4)} \right\}$

6   2. Find the limit for the following sequence of functions on the interval $-1 < x \le 100$, if it exists. Show your reasoning or calculations.

$$\left\{ \frac{n^2 x^2 + 5x + n}{3n^2 - x^{15}} + x \right\}$$

8   3. Determine whether the following series converge or diverge. Justify your conclusions.

(a) $\displaystyle\sum_{n=1}^{\infty} \frac{n^2}{3n^2 + 2n + 5}$ (b) $\displaystyle\sum_{n=2}^{\infty} \frac{e^n}{3^{2n}}$

6   4. Find the sum of the series $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{5^n} (x+1)^n$. Include its interval of convergence.

10   5. Find the interval of convergence for the power series

$$\sum_{n=3}^{\infty} \frac{1}{n4^n} (x-2)^{2n}?$$

Justify all results.