

Values

- 2 1. The limit of the sequence $\left\{ \frac{(-1)^n n^2 + 3n}{2n^2 + 5} \right\}$ is
(a) $1/2$ (b) $\pm 1/2$ (c) ∞ (d) $-\infty$ (e) None of these
- 2 2. The limit of the sequence $\left\{ \frac{2n^2 + 3}{5 - 3n^2} \sin^{-1} \left(\frac{n+2}{2n-3} \right) \right\}$ is
(a) -1 (b) $\pi/10$ (c) $-\pi/9$ (d) $\pi/6$ (e) None of these
- 2 3. The sum of the series $\sum_{n=1}^{\infty} \left(-\frac{3}{4} \right)^{n+1}$ is
(a) $9/28$ (b) $9/4$ (c) $-3/7$ (d) -3 (e) None of these
- 2 4. The sum of the series $\sum_{n=1}^{\infty} n \left(\frac{7}{4} \right)^n$ is
(a) $-7/3$ (b) $7/3$ (c) ∞ (d) $-\infty$ (e) None of these
- 2 5. The limit of the sequence of functions $\left\{ \left(1 + \frac{x}{2n} \right)^n \right\}$ on the interval $0 \leq x < 1$ is
(a) 1 (b) $e^{x/2}$ (c) $x/2$ (d) Does not exist (e) None of these

10 6. Prove that the Maclaurin series for e^{3x} converges to e^{3x} for all x .

- 8 7. What is the interval of convergence for the power series

$$\sum_{n=1}^{\infty} \frac{n+1}{n4^n} x^n?$$

Justify all results.

- 12 8. Find the Taylor series about $x = 4$ for the function

$$f(x) = \frac{1}{(x-2)^2}.$$

Express your answer in sigma notation simplified as much as possible. You must use a technique that guarantees that the Taylor series converges to the function. What is the radius of convergence of the series?