

Values

- 4 1. Find the limit of the sequence of functions $\{f_n(x)\}$ on the interval $0 \leq x \leq 5$, if it exists. Justify your answer.

$$f_n(x) = \frac{2n^2x + nx}{n^2 + 1}$$

- 5 2. Find the Taylor series about $x = -2$ for the function $f(x) = e^{2x+1}$. Include its interval of convergence.

- 9 3. Find the open interval of convergence for the power series

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

Express your answer in the form $a < x < b$ for appropriate values of a and b .

- 10 4. Find the Maclaurin series for the function $f(x) = \frac{x}{(2+x)^2}$. What is the interval of convergence of the series?

- 12 5. Find the Maclaurin series for the function $f(x) = \frac{1}{\sqrt[3]{8+3x}}$. Find the radius of convergence of the series.