

1. For what values of x does

$$\sum_{k=1}^{\infty} \frac{kx^k}{3^k}$$

converge. Explain your reasoning.

2. How many terms of the Maclaurin series for $\ln(1+x)$ are needed to estimate $\ln(1.5)$ to within 0.0001?

3. Find the Taylor series for $f(x) = \ln(x)$ when $a = 1$.

4. If $f(x)$ is an odd function then $\int_{-a}^a f(x) dx = 0$.

(a) Draw a graph and explain why.

(b) Use the algebraic definition of an odd function to explain why. [Hint: Consider

$$G(x) = \int_0^x f(t) dt]$$

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