

Problem statement In the following series x is a real number. In each case use the ratio test to determine the radius of convergence of the series. Analyze the behavior of the series at the endpoints in order to determine the interval of convergence.

a) $\sum_{n=0}^{\infty} \frac{nx^n}{n^2 + 1}$

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

c) $\sum_{n=1}^{\infty} \frac{3^n x^n}{n^2}$