$R=\frac{1}{3}$ $-1<3x<$ $-\frac{1}{3}<x<\frac{1}{3}$ $-\frac{1}{3}<x\le\frac{1}{3}$ $x=\frac{1}{3}$ conditional convergence	2015 AP Calculus BC Free Response 6. The Maclaurin Series for a function f is given by $$\sum_{n=1}^{\infty}\frac{(-3)^{n-1}}{n}x^n = x-\frac{3}{2}x^2+3x^3-\cdots+\frac{(-3)^{n-1}}{n}x^n+\cdots$$ and converges to f(x) for $\lvert x\rvert<R$, where R is the radius of convergence of the Maclaurin series. a) Use the Ratio Test to find R. $\lim_{n\to\infty}\left\lvert\frac{(-3)^n x^{n+1}}{(n+1)}\cdot\frac{n}{(-3)^{n-1}x^n}\right\rvert=\lim_{n\to\infty}\left\lvert\frac{x\ n}{3^{-1}(n+1)}\right\rvert=\lvert 3x\rvert<1$ Interval of Convergence $x=-\frac{1}{3}\quad\sum\frac{(-3)^{n-1}(\frac{1}{-3})^n}{n}=\sum\frac{(-3)^n(-3)^{-1}(\frac{1}{-3})^n}{n}=\sum\frac{-1}{3n}$ multiple of Harmonic $x=\frac{1}{3}\quad\sum\frac{(-3)^{n-1}(\frac{1}{3})^n}{n}=\sum\frac{(-3)^n(-3)^{-1}(\frac{1}{3})^n}{n}=\sum(-1)^n\left(\frac{-1}{3n}\right)=\sum\frac{(-1)^{n+1}}{3n}$ multiple of alternating harmonic 20. What are all values of x for which the series $\sum_{n=1}^{\infty}\frac{(x-2)^n}{n3^n}$ converges? (A) $-3\le x\le 3$ (B) $-3<x<3$ (C) $-1<x\le 5$ (D) $-1\le x\le 5$ (E) $-1\le x<5$