

QUIZ # 8SUBSECTION: A, SNAME: Baili MinID # 389954

1) Find the series radius and interval of convergence.

$$\sum_{n=0}^{\infty} \frac{(x-2)^n}{10^n} = \sum_{n=0}^{\infty} \frac{1}{10^n} (x-2)^n = \sum_{n=0}^{\infty} a_n (x-2)^n$$

$$R = \lim_{n \rightarrow \infty} \frac{1}{n \sqrt[n]{\frac{1}{10^n}}} = 10 \quad (\text{b/c } a_n = \frac{1}{10^n}) \rightarrow \text{radius.}$$

$$|x-2| < 10 \Rightarrow 8 < x < 12 \rightarrow \text{interval (DIV at } x=8, 12)$$

$$2) \sum_{n=0}^{\infty} a_n x^n = \sum_{n=0}^{\infty} \frac{\sqrt{n}}{3^n} x^n, \quad a_n = \frac{\sqrt{n}}{3^n}$$

$$R = \lim_{n \rightarrow \infty} \frac{1}{n \sqrt[n]{\frac{\sqrt{n}}{3^n}}} = \lim_{n \rightarrow \infty} \frac{\sqrt[n]{3^n}}{n \sqrt[n]{\sqrt{n}}} = \lim_{n \rightarrow \infty} \frac{3}{(n^{\frac{1}{2}})^{\frac{1}{n}}} = \lim_{n \rightarrow \infty} \frac{3}{(n^{\frac{1}{n}})^{\frac{1}{2}}} = 3$$

$$(\text{b/c } \lim_{n \rightarrow \infty} n^{\frac{1}{n}} = 1)$$

↓
Radius

$$|x| < 3 \Rightarrow -3 < x < 3 \rightarrow \text{interval. (DIV at } x = \pm 3)$$