

Calculus II Raio de Convergência

$$a \cdot \sum (-1)^n n x^n$$

$$a_n = (-1)^n n x^n$$

$$a_{n+1} = (-1)^{n+1} (n+1) x^{n+1}$$

$$\lim_{n \rightarrow \infty} \left| \frac{a_{n+1}}{a_n} \right| = \left| \frac{(-1)^{n+1} (n+1) x^{n+1}}{(-1)^n n x^n} \right|$$

$$\lim_{n \rightarrow \infty} \left| \frac{(-1) \cdot (n+1)}{n} x \right| = \left[\left(1 + \frac{1}{n} \right) |x| \right] = 1 \cdot |x| = |x|$$

A série converge quando $|x| < 1$

Raio de Convergência ($R = 1$)

$$x = \pm 1$$

$$\sum_{n=1}^{\infty} (-1)^n n (\pm 1)^n = \sum_{n=1}^{\infty} (\pm 1)^n n$$

$$\lim_{n \rightarrow \infty} |a_n| = |(\pm 1)^n n| = \infty$$

$$I = (-1, 1)$$

$$R = 1$$

Coca-Cola

$$b \cdot f \frac{x^n}{2n-3}$$

$$a_n - \frac{x^n}{2n-3}$$

$$a_{n+1} = \frac{x^{n+1}}{2n}$$

$$\lim_{n \rightarrow \infty} \left| \frac{a_{n+1}}{a_n} \right| = \left| \frac{\frac{x^{n+1}}{2n}}{\frac{x^n}{2n-1}} \right|$$

$$R = 3 \\ I = (-1, 1) \\ //$$

Refreshing