מהו טור מקלורן של $\sin^2(x)$?

תשובות:

יש לבחור תשובה אחת:

a. $\sum_{n=0}^{\infty}(-1)^n \cdot \frac{2^{2n+1}}{(2n+2)!} \cdot x^{2n+2}$

b. $\sum_{n=0}^{\infty}(-1)^{n+1} \cdot \frac{2^{2n+1}}{(2n+2)!} \cdot x^{2n+2}$

c. $\sum_{n=1}^{\infty}(-1)^{n+1} \cdot \frac{2^{2n+1}}{(2n+2)!} \cdot x^{2n+2}$

d. $\sum_{n=1}^{\infty}(-1)^n \cdot \frac{2^{2n+1}}{(2n+2)!} \cdot x^{2n+2}$

$$\cos 2\alpha = 1 - 2sin^2\alpha \quad => \quad sin^2\alpha = \frac{1-\cos 2\alpha}{2}$$

$$\cos x = 1 - \frac{1}{2!} \cdot x^2 + \frac{1}{4!} \cdot x^4 - \frac{1}{6!} \cdot x^6 + \ldots + \frac{(-1)^n}{(2n)!} \cdot x^{2n} = \sum_{k=0}^{\infty} \frac{(-1)^k}{(2k)!} \cdot x^{2k}$$

$$\cos(2x) = 1 - \frac{1}{2!} \cdot (2x)^2 + \frac{1}{4!} \cdot (2x)^4 - \frac{1}{6!} \cdot (2x)^6 + \ldots + \frac{(-1)^n}{(2n)!} \cdot (2x)^{2n} = \sum_{k=0}^{\infty} \frac{(-1)^k}{(2k)!} \cdot 2^{2k} \cdot x^{2k}$$

$$1 - \cos 2x = \frac{1}{2!} \cdot (2x)^2 - \frac{1}{4!} \cdot (2x)^4 + \frac{1}{6!} \cdot (2x)^6 - \frac{1}{8!} \cdot (2x)^8 + \ldots + \frac{(-1)^n}{[2(n+1)]!} \cdot (2x)^{2(n+1)} = \sum_{k=0}^{\infty} \frac{(-1)^k}{(2n+2)!} \cdot 2^{2k+2} \cdot x^{2k+2}$$

$$\frac{1-\cos 2x}{2} = \sum_{k=0}^{\infty} \frac{(-1)^k}{(2n+2)!} \cdot 2^{2k+1} \cdot x^{2k+2} = \sum_{k=0}^{\infty} (-1)^k \frac{2^{2k+1}}{(2n+2)!} \cdot x^{2k+2}$$

$$sin^2 x = \frac{1-\cos 2x}{2} = \sum_{k=0}^{\infty} (-1)^k \frac{2^{2k+1}}{(2n+2)!} \cdot x^{2k+2}$$