Tarea

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Obtener la serie de Taylor de $f(x) = \operatorname{sen} x$ alrededor de $x = 0$.

$$\sum_{n=0}^{\infty} \frac{f^{(n)}(0)}{n!} x^n = f(0) + f'(0)x + \frac{f''(0)}{2!}x^2 + \frac{f'''(0)}{3!}x^3 + \frac{f^{IV}(0)}{4!}x^4 + \dots$$

$n=0 \Rightarrow f(x) = \operatorname{sen} x \Rightarrow f(0) = 0$

$n=1 \Rightarrow f'(x) = \cos x \Rightarrow f'(0) = 1$

$n=2 \Rightarrow f''(x) = -\operatorname{sen} x \Rightarrow f''(0) = 0$

$n=3 \Rightarrow f'''(x) = -\cos x \Rightarrow f'''(0) = -1$

$n=4 \Rightarrow f^{IV}(x) = \operatorname{sen} x \Rightarrow f^{IV}(0) = 0$

$n=5 \Rightarrow f^{V}(x) = \cos x \Rightarrow f^{V}(0) = 1$

$$\operatorname{sen} x = 0 + x + 0 - \frac{x^3}{3!} + 0 + \frac{x^5}{5!} + 0 - \frac{x^7}{7!} + 0 + \frac{x^9}{9!} + 0 - \frac{x^{11}}{11!} + \dots$$

$$\operatorname{sen} x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \frac{x^9}{9!} - \frac{x^{11}}{11!} + \dots$$

$$\operatorname{sen} x = \sum_{n=0}^{\infty} \frac{(-1)^n}{(2n+1)!} x^{2n+1}$$