$$\int_{x_l}^{x_u} \mathrm{e}^{-u^2}\,\mathrm{d}u = ?$$

$$\int_0^{3\Delta x} \mathrm{e}^{-u^2}\,\mathrm{d}u = \int_0^{\Delta x} \mathrm{e}^{-u^2}\,\mathrm{d}u + \int_{\Delta x}^{2\Delta x} \mathrm{e}^{-u^2}\,\mathrm{d}u + \int_{2\Delta x}^{3\Delta x} \mathrm{e}^{-u^2}\,\mathrm{d}u.$$

Os termos da série que desejo calcular podem ser obtidos recursivamente:

$$\begin{aligned} n! &= n \times (n-1)! \\ (2n+1) &= 2([n-1]+1)+1; \\ &= 2(n-1)+2+1 \\ &= \underbrace{2(n-1)+1}_{\text{Faz o papel do ``}2n+1\text{'' anterior}} +2 \end{aligned}$$

Portanto,

$$\begin{aligned} B_n &= 2n+1, \\ B_n &= \underbrace{2(n-1)+1}_{B_{n-1}}+2, \\ B_n &= B_{n-1}+2. \end{aligned}$$

Finalmente, e detráspráfrentemente,

$$\begin{aligned} A_n &= (-1)^n \times x^{2n+1} \\ &= (-1)^n \times x^{2(n-1+1)+1} \\ &= (-1)^n \times x^{2(n-1)+2+1} \\ &= (-1)^n \times x^{2(n-1)+1+2} \\ &= \underbrace{(-1)^{n-1} \times x^{2(n-1)+1}}_{A_{n-1}} \times (-1) \times x^2 \\ A_n &= A_{n-1} \times (-1) \times x^2. \end{aligned}$$