$$\left(\frac{1}{\sqrt{2}}\left(\frac{1}{\pi}\right)^{1/4} e^{-\frac{x^2}{2}} \cdot 2x\right)^2 \cdot x^2$$

$$\frac{1}{2}\left(\left(\frac{1}{\pi}\right)^{1/2} e^{-x^2} \cdot 4x^2\right) \cdot x^2$$

$$\left(\frac{1}{\pi}\right)^{1/2} e^{-x^2} 2x^4$$

$$f(x) = \left(\frac{1}{\pi}\right)^{1/2} 2x^4 e$$