Problema 10.5
$$H(x) = x \int_{2x}^{3x} e^{-t^2}\, dt \implies H \in C^{\infty}(\mathbb{R}).$$

$$H'(x) = \int_{2x}^{3x} e^{-t^2}\, dt + x\left(3e^{-3^2 x^2} - 2e^{-2^2 x^2}\right)$$

$$= 3x\, e^{-9x^2} - 2x\, e^{-4x^2} + \int_{2x}^{3x} e^{-t^2}\, dt \,, \quad x \in \mathbb{R}.$$

$$H''(x) = (3 - 54x^2)e^{-9x^2} + (16x^2 - 2)e^{-4x^2}$$

$$+ 3e^{-9x^2} - 2e^{-4x^2}$$

$$= (6 - 54x^2)\, e^{-9x^2} + (16x^2 - 4)e^{-4x^2} \,; \quad x \in \mathbb{R}$$