$$\hat{s}(\lambda) = \int_{\mathbb{R}} s(t)\, e^{-i 2\pi \lambda t}\, dt$$

$$\check{s}(\lambda) = \int_{\mathbb{R}} s(t)\, e^{i 2\pi \lambda t}\, dt$$

$$g(x) = e^{-\pi x^2} \qquad \hat{g}(\lambda) = e^{-\pi \lambda^2}$$

$$g(\varepsilon x) = e^{-\pi (\varepsilon x)^2} \qquad \widehat{g(\varepsilon \cdot)}(\lambda) = \frac{1}{\varepsilon} e^{-\pi \left(\frac{\lambda}{\varepsilon}\right)^2}$$

$\varepsilon > 0$

$$f(x) = \widehat{s * g(\varepsilon \cdot)}(x) = \int_{\mathbb{R}} \int_{\mathbb{R}} s(t)\, e^{-i 2\pi \lambda t}\, dt\; g(\varepsilon \lambda)\, e^{i 2\pi x \lambda}\, d\lambda =$$

$$= \int_{\mathbb{R}} s(t) \int_{\mathbb{R}} g(\varepsilon \lambda)\, e^{-i 2\pi (x-t) \lambda}\, d\lambda\, dt = \int_{\mathbb{R}} s(t)\, \frac{1}{\varepsilon} e^{-\pi \left(\frac{x-t}{\varepsilon}\right)^2} dt$$

$$= \left| \begin{array}{l} t = x + \varepsilon m \\ m\varepsilon = x - t \end{array} \right| = \int_{\mathbb{R}} s(x + \varepsilon m)\, e^{-\pi m^2}\, dm \longrightarrow s(x) \quad \text{quad } \varepsilon \to 0$$

s DERIVADES V

s NEGATIVA:

$$= \int_{-\infty}^{0} s(x + \varepsilon m)\, e^{-\pi m^2}\, dm + \int_{0}^{\infty} s(x + \varepsilon m)\, e^{-\pi m^2}\, dm = \frac{s(x^-) + s(x^+)}{2}$$