$$\hat{f}(\nu) = \int_{\mathbb{R}} f(t)\, e^{-i 2\pi \nu t}\, dt \qquad \hat{f}(0) = \int f$$

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

$$g_-(x) = g(-x)$$

$$(f * g)(x) = \int_{\mathbb{R}} f(y)\, g(x-y)\, dy$$

$$(f * g_-)(0) = \int f(y)\, g(y)\, dy$$

$$\overline{\hat{f}} = \int_{\mathbb{R}} \overline{f}(t)\, e^{i 2\pi \nu t}\, dt = \int_{\mathbb{R}} \overline{f}(-t)\, e^{-i 2\pi \nu t}\, dt = \widehat{\overline{f}_-}$$

$$\check{\overline{\hat{f}}} = \overline{f}_-$$

$$\int_{\mathbb{R}} \hat{f}\,\overline{\hat{g}} = \widehat{f\,\overline{\hat{g}}}\,(0) = f * \check{\overline{\hat{g}}}\,(0) = f * \overline{g}_-(0) = \int f\,\overline{g}$$

$$\|\hat{f}\|^2 = \int \hat{f}\,\overline{\hat{f}} = \int f\,\overline{f} = \|f\|^2$$