Trasformate di Fourier più significative

(1) $$f(t), \qquad \hat{f}(\omega) = \int_{\mathbf{R}} f(t)\, e^{-i\omega t}\, dt$$

(2) $$g(t) = f(t-a), \qquad \hat{g}(\omega) = e^{-i\omega a}\, \hat{f}(\omega)$$

(3) $$g(t) = e^{i\omega_0\, t} f(t), \qquad \hat{g}(\omega) = \hat{f}(\omega - \omega_0)$$

(4) $$g(t) = f(a\, t),\ a > 0, \qquad \hat{g}(\omega) = \frac{1}{a}\hat{f}(\frac{\omega}{a})$$

(5) $$g(t) = t\, f(t), \qquad \hat{g}(\omega) = i\frac{d\hat{f}}{d\omega}(\omega)$$

(6) $$g(t) = f'(t), \qquad \hat{g}(\omega) = i\omega\, \hat{f}(\omega)$$

(7) $$f(t) = \frac{1}{1+t^2}, \qquad \hat{f}(\omega) = \pi e^{-|\omega|}$$

(8) $$f(t) = \frac{1}{a^2+t^2}, \qquad \hat{f}(\omega) = \frac{\pi}{a} e^{-a|\omega|}$$

(9) $$f(t) = e^{-|t|}, \qquad \hat{f}(\omega) = \frac{2}{1+\omega^2}$$

(10) $$f(t) = e^{-a|t|}, \qquad \hat{f}(\omega) = \frac{2a}{a^2+\omega^2}$$

(11) $$f(t) = e^{-t^2}, \qquad \hat{f}(\omega) = \sqrt{\pi}\, e^{-\frac{\omega^2}{4}}$$

(12) $$f(t) = e^{-a\, t^2},\ a > 0, \qquad \hat{f}(\omega) = \sqrt{\frac{\pi}{a}}\, e^{-\frac{\omega^2}{4a}}$$

(13) $$f(t) = \chi_{[-a,a]}(t), \qquad \hat{f}(\omega) = 2\frac{\sin a\, \omega}{\omega}$$

(14) $$f(t) = (a+t)\chi_{[-a,0]}(t) + (a-t)\chi_{[0,a]}(t), \qquad \hat{f}(\omega) = 2\frac{1-\cos a\,\omega}{\omega^2}$$

(15) $$f(t) = \frac{\sin^2 a\,t}{t^2},\ a>0, \qquad \hat{f}(\omega) = \pi(a+\frac{\omega}{2})\chi_{[-2a,0]}(\omega) + \pi(a-\frac{\omega}{2})\chi_{[0,2a]}(\omega)$$

(16) $$f(t) = -\chi_{[-a,0]}(t) + \chi_{[0,a]}(t),\ a>0, \qquad \hat{f}(\omega) = -2i\frac{1-\cos a\,\omega}{\omega}$$

(17) $$f(t) = \frac{1}{(a^2+t^2)(b^2+t^2)},\ a\neq b,\ a,b>0, \qquad \hat{f}(\omega) = \frac{\pi(b^{-1}e^{-b|\omega|} - a^{-1}e^{-a|\omega|})}{a^2-b^2}$$

(18) $$f(t) = \frac{1}{(a^2+t^2)^2},\ a>0, \qquad \hat{f}(\omega) = \frac{\pi}{2a^3}(a|\omega|+1)e^{-a|\omega|}$$

(19) $$f(t) = \frac{1}{a^4+t^4},\ a>0, \qquad \hat{f}(\omega) = \frac{\pi}{a^3}e^{-a|\omega|/\sqrt{2}}\sin(\frac{\pi}{4}+\frac{a|\omega|}{\sqrt{2}})$$

(20) $$f(t) = \frac{\sin t}{t}e^{-|t|}, \qquad \hat{f}(\omega) = \arctan\frac{2}{\omega^2}$$

(21) $$h(t) = f*g(t), \qquad \hat{h}(\omega) = \hat{f}(\omega)\cdot\hat{g}(\omega)$$

(22) $$h(t) = f(t)\cdot g(t), \qquad \hat{h}(\omega) = \frac{1}{2\pi}\hat{f}*\hat{g}(\omega)$$