

## *Trasformate di Fourier di funzioni.*

$u(t)$	$\hat{u}(f) := \int_{-\infty}^{+\infty} u(t)e^{-2\pi i f t} dt$	
$H(t)e^{-at}$	$\frac{1}{a + 2\pi i f}$	$a \in \mathbb{C}, \operatorname{Re} a > 0$
$e^{-a t }$	$\frac{2a}{a^2 + (2\pi f)^2}$	$a \in \mathbb{C}, \operatorname{Re} a > 0$
$\frac{1}{a^2 + t^2}$	$\frac{\pi}{a} e^{-a 2\pi f }$	$a \in \mathbb{C}, \operatorname{Re} a > 0$
$e^{-\pi t^2}$	$e^{-\pi f^2}$	
$\frac{1}{\sqrt{2\pi\sigma}} e^{-\frac{t^2}{2\sigma^2}}$	$e^{-2\pi^2\sigma^2 f^2}$	$\sigma \in \mathbb{C},  \arg(\sigma)  < \pi/4$
$H(t)t^{\beta-1}e^{-at}$	$\frac{\Gamma(\beta)}{(a + 2\pi i f)^\beta}$	$a, \beta \in \mathbb{C}, \operatorname{Re} a, \operatorname{Re} \beta > 0$
$\frac{1}{(t-a)^n}$	$2\pi i H(-f) \frac{(-2\pi i f)^{n-1}}{(n-1)!} e^{-2\pi i a f}$	$a \in \mathbb{C}, n \in \mathbb{N}, \operatorname{Im} a > 0$
$\frac{1}{(t-a)^n}$	$-2\pi i H(f) \frac{(-2\pi i f)^{n-1}}{(n-1)!} e^{-2\pi i a f}$	$a \in \mathbb{C}, n \in \mathbb{N}, \operatorname{Im} a < 0$
$\operatorname{rect}(t) = \chi_{(-1/2, 1/2)}(t)$	$\operatorname{sinc}(f) = \frac{\sin(\pi f)}{\pi f}$	
$\operatorname{rect}(t/a) = \chi_{(-a/2, a/2)}(t)$	$a \operatorname{sinc}(af)$	$a > 0$
$\chi_{(a,b)}(t)$	$(b-a)e^{-\pi i(a+b)f} \operatorname{sinc}((b-a)f),$	
$\operatorname{sign}(t) \operatorname{rect}(t/a)$	$\frac{1 - \cos(\pi a f)}{\pi i f} = \frac{\sin^2(\frac{\pi}{2} a f)}{\frac{\pi}{2} i f}$	$a > 0$
$\Delta(t) = (1 -  t )^+$	$\operatorname{sinc}^2(f) = 2 \frac{1 - \cos(2\pi f)}{(2\pi f)^2}$	$a > 0$
$\frac{1}{(a^2 + t^2)(b^2 + t^2)}$	$\pi \frac{ae^{-b 2\pi f } - be^{-a 2\pi f }}{ab(a^2 - b^2)}$	$a, b > 0, a \neq b$
$\frac{1}{(a^2 + t^2)^2}$	$\frac{\pi}{2a^3} (1 + a 2\pi f ) e^{-a 2\pi f }$	$a > 0$
$\frac{1}{a^4 + t^4}$	$\frac{\pi}{a^3} e^{-\sqrt{2}\pi a f } \sin(\pi/4 + \sqrt{2}\pi a f )$	$a > 0$
$\chi_{(-1,1)}(t) \log  t $	$-\frac{2}{2\pi f} \operatorname{Si}(2\pi f)$	