DIRAC (DELTA) FUNCTION (PROPERTIES)

Fourier Transform	Multiplication	Integration	Convolution
$\delta(t) \leftrightarrow 1$	$g(t)\cdot\delta(t) = g(0)\cdot\delta(t)$	$\int_{-\infty}^{\infty}\delta(t)dt = 1$	$g(t)\otimes\delta(t) = g(t)$
$1 \leftrightarrow \delta(f)$	$g(t)\cdot\delta(t-t_o) = g(t_o)\cdot\delta(t-t_o)$	$\int_{-\infty}^{\infty}\delta(t-t_o)dt = 1$	$g(t)\otimes\delta(t-t_o) = g(t-t_o)$
$\delta(t\pm t_o) \leftrightarrow e^{\pm j2\pi ft_o}$		$\int_{-\infty}^{\infty} g(t)\cdot\delta(t)dt = g(0)$	$g(t-t_1)\otimes\delta(t-t_o) = g(t-t_1-t_o)$
$e^{\mp j2\pi.tf_o} \leftrightarrow \delta(f\pm f_o)$		$\int_{-\infty}^{\infty} g(t)\cdot\delta(t-t_o)dt = g(t_o)$	
$\frac{1}{a}\delta(t) \leftrightarrow \frac{1}{a}$		$\int_{-\infty}^{t}\delta(\tau)d\tau = u(t)$	
$\delta(at) \leftrightarrow \frac{1}{a}$			
Hints:	$\delta(at) = \frac{1}{a}\delta(t)$	— $\frac{d}{dt}u(t) = \delta(t)$	