Brief table of Fourier transforms

We define the transform as

$$F(k) = \int_{-\infty}^{\infty} e^{-ikx} f(x) dx$$

(note that Haberman's text adds a factor of $1/2\pi$ in the transform and conversely deletes a factor of $1/2\pi$ in the inverse transform).

Description	Function	Transform
Delta function in x	$\delta(x)$	1
Delta function in k	1	$2\pi\delta(k)$
Exponential in x	$e^{-a\|x\|}$	$\frac{2a}{a^2+k^2}$
Exponential in k	$\frac{2a}{a^2+x^2}$	$2\pi e^{-a\|k\|}$
Gaussian	$e^{-x^2/2}$	$\sqrt{2\pi}e^{-k^2/2}$
Derivative in x	$f'(x)$	$ikF(k)$
Derivative in k	$xf(x)$	$iF'(k)$
Translation in x	$f(x-a)$	$e^{-iak}F(k)$
Translation in k	$e^{iax}f(x)$	$F(k-a)$
Dilation in x	$f(ax)$	$F(k/a)/a$
Convolution	f(x)*g(x)	$F(k)G(k)$