• Many authors, most notably for me Brad Osgood, use a 'script notation' for the Fourier transform.

$$\mathcal{F}f(s) = \int_{-\infty}^{\infty} f(t)\, e^{-2\pi i s t}\, dt$$

and

$$\mathcal{F}^{-1}f(t) = \int_{-\infty}^{\infty} f(s)\, e^{2\pi i s t}\, ds$$

The notation should be interpretted as

1) $\mathcal{F}f$ means substitute f into a Fourier integral

2) the absence or presence of the inverse symbol, -1, indicates which sign to use in the exponential

3) the variable that follows (s) indicates the free variable in the integral, the other being a dummy