

$$F(\omega) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\infty} f(x) e^{-i\omega x} dx$$

$$F(\omega) = \mathcal{F}(f(x))$$

$$\mathcal{F}\left(\frac{df(x)}{dx}\right) = i\omega F(\omega)$$

$$\mathcal{F}(f(x+a)) = e^{i\omega a} F(\omega)$$

$$f(x) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\infty} F(\omega) e^{i\omega x} d\omega$$