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Selected Problems

1. Prove that the Fourier Transform of $\delta(x)$ is equal to 1 .

2. Prove that the Fourier Transform of $\delta(x-x_0)$ is equal to e^{-ikx_0} .

3. Find two alternative definitions for Dirac's δ function.

4. Prove that the Fourier Transform of a Gaussian is also a Gaussian.

5. Devise an equation to determine a plausible size for a convolution kernel containing a Gabor filter tuned to spatio-temporal frequency (k_x, k_y, ω) .