

$$a_1 = \frac{1}{\pi} * \int_{-\pi}^{\pi} \cos\left[x - \frac{\pi}{4}\right] * \cos[x] dx$$

$$\frac{1}{\sqrt{2}}$$

$$b_1 = \frac{1}{\pi} * \int_{-\pi}^{\pi} \cos\left[x - \frac{\pi}{4}\right] * \sin[x] dx$$

$$\frac{1}{\sqrt{2}}$$

$$c_1 = \frac{1}{2 * \pi} * \int_{-\pi}^{\pi} \cos\left[x - \frac{\pi}{4}\right] * e^{-i * 1 * x} dx$$

$$-\frac{1}{2} (-1)^{3/4}$$

$$\frac{\frac{1}{2} - \frac{i}{2}}{\sqrt{2}}$$

$$c_{-1} = \frac{1}{2 * \pi} * \int_{-\pi}^{\pi} \cos\left[x - \frac{\pi}{4}\right] * e^{i * 1 * x} dx$$

$$\frac{1}{2} (-1)^{1/4}$$

$$\frac{\frac{1}{2} + \frac{i}{2}}{\sqrt{2}}$$

$$\pi * a_1^2 + \pi * b_1^2$$

$\pi$

$$2 * \pi * \frac{\frac{1}{2} - \frac{i}{2}}{\sqrt{2}} * \frac{\frac{1}{2} + \frac{i}{2}}{\sqrt{2}} + 2 * \pi * \frac{\frac{1}{2} + \frac{i}{2}}{\sqrt{2}} * \frac{\frac{1}{2} - \frac{i}{2}}{\sqrt{2}}$$

$\pi$

$$\int_0^{2 * \pi} \cos\left[x - \frac{\pi}{4}\right]^2 dx$$

$\pi$