2024 Sep 20

$$x(t) = 5\cos\left(2\pi 4100 t + \frac{5\pi}{6}\right)$$

$F_s = 7200$ Hz

$$\omega = 2\pi \frac{f}{F_s} = 2\pi \frac{4100}{7200}$$

$$z = \frac{5}{2} e^{-j 5\pi/6}$$

$$2\pi - \omega = 2\pi\left(1 - \frac{4100}{7200}\right) = 2\pi\left(\frac{3100}{7200}\right)$$

$$z_a = z^* = \frac{5}{2} e^{-j 5\pi/6}$$

$$2\pi + \omega = 2\pi\left(1 + \frac{4100}{7200}\right) = 2\pi\left(\frac{11300}{7200}\right)$$

$$z_a = z = \frac{5}{2} e^{j 5\pi/6}$$

$$4\pi - \omega = 2\pi\left(2 - \frac{4100}{7200}\right) = 2\pi\left(\frac{10300}{7200}\right)$$

$$z_a = z^* = \frac{5}{2} e^{-j 5\pi/6}$$