a)
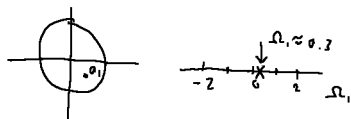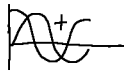
$x[n=0] = a_1 + a_1^* = 2 \, Re(a_1) \approx 0.7$

$T = 20 \quad \Omega_1 n = \pi$

$a = Re(a_1) \approx 0.35$

$x_1[n] = -a_1 - a_1^*$

$= -2 \, Re(a_1)$

$a_1 = a + b_i$

$\sqrt{a^2 + b^2} = 0.5 \quad |b| \approx 0.35$

$\Omega_1 \cdot 10 = \pi$

$\Omega_1 = \frac{\pi}{10} \approx 0.314$

b) $T = 10 \quad 2\pi = 10 \, \Omega_2 \quad \boxed{\Omega_2 = \frac{\pi}{5} \approx 0.63}$

$\sqrt{c_2^2 + d_2^2} = 1$

$\boxed{\begin{array}{l} c_2 \approx \frac{\sqrt{2}}{2} \approx 0.7 \\ d_2 \approx \frac{\sqrt{2}}{2} \approx 0.7 \end{array}}$

c) $T = 30 \quad 2\pi = 30 \, \Omega_3 \quad \boxed{\Omega_3 = \frac{\pi}{15} \approx 0.21}$

$\boxed{\phi = \frac{-3\pi}{4}}$

d) $2\pi = \Omega_4 n \quad T = 20 \quad \boxed{\Omega_4 = \frac{\pi}{10}}$

$|a_4| = 1$