PROBLEM:

(a) Let $w(t) = \cos(100\pi t + \pi/4) + 2\cos(100\pi t - \pi/4) = A\cos(\omega_0 t + \phi)$.
Determine A, ω_0, and ϕ.

$A =$

$\omega_0 =$

$\phi =$

(b) A periodic signal $x(t)$ is given by

$$x(t) = 2 + 2\cos(1000\pi t + \theta) + \cos(1500\pi t + \psi).$$

Determine the period T_0 of this signal.

$T_0 =$

(c) If the Fourier series coefficients of the signal $x(t)$ in part (b) are $a_0 = 2$, $a_2 = e^{j\pi/2}$, $a_{-2} = e^{-j\pi/2}$, $a_3 = 0.5e^{-j\pi/6}$, and $a_{-3} = 0.5e^{j\pi/6}$, determine θ and ψ for the signal $x(t)$.

$\theta =$

$\psi =$