

PROBLEM:

Solve the following simultaneous equations via the phasor method. Is the answer for A_1 , A_2 , ϕ_1 , ϕ_2 unique? Provide a geometrical diagram to explain the answer.

$$\cos(\omega_0 t) = A_1 \cos(\omega_0 t + \phi_1) + A_2 \cos(\omega_0 t + \phi_2)$$

$$\sin(\omega_0 t) = 2A_1 \cos(\omega_0 t + \phi_1) + A_2 \cos(\omega_0 t + \phi_2)$$