

PROBLEM:

For both parts below draw a *phasor diagram* to illustrate the solution.

- (a) Solve for $x[n]$ in the following equation:

$$x[n] = 3 \cos(n - 5\pi/3) + 5 \cos(n + 3\pi) + 5 \cos(n - 7\pi/3) \quad \text{for } n = 0, \pm 1, \pm 2, \dots$$

Express $x[n]$ in the form $x[n] = A \cos(\omega_0 n + \phi)$

- (b) Use the idea of a “rotating phasor” to find a solution to

$$A \cos(\omega_0 n + \phi) - 2A \cos(\omega_0(n - 2) + \phi) = 3 \cos(\pi n/3) \quad \boxed{\text{for all } n}$$

Determine numerical values for ω_0 , A and ϕ .

Show the vector diagram of the phasor addition for the fixed value of $n = 0$.