

## PROBLEM:

For both parts below draw a phasor diagram.

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

$$x[n] = 3 \cos(n + 5\pi/3) + 3 \cos(n + 3\pi) + 5 \cos(n + 7\pi/3)$$

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

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

Determine numerical values for  $\omega_0$ ,  $A$  and  $\phi$ .

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