PROBLEM:

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

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

$$x[n] = 2\cos(n - 5\pi) + \cos(n + 3\pi/4) - \cos(n - 7\pi/2) \qquad \text{for } n = 0, \pm 1, \pm 2, \ldots$$

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

(b) Use the idea of a "rotating phasor" to find a solution to

$$2A\cos(\omega_0 n + \phi) + 3A\cos(\omega_0(n-1) + \phi) = \sin(\pi n/4) \qquad \boxed{\text{for all } n}$$

Determine numerical values for ω_0, A and ϕ.
Show the vector diagram of the phasor addition for the fixed value of $n = 0$.