PROBLEM:

The frequency response of the filter above is

$$\mathcal{H}(\hat{\omega}) = (1 + \cos(\hat{\omega}))e^{-j3\hat{\omega}}$$

If the input signal is $\quad x[n] = 3 + 4\cos(0.5\pi n + 0.3\pi) \quad$ for $-\infty < n < \infty$,
determine a simple mathematical expression for the output signal $y[n]$.

$y[n] = 6 + 4\cos(0.5\pi n - 1.2\pi)$