PROBLEM:

A signal composed of sinusoids is given by the equation

$$x(t) = 2\cos(6\pi t) + 3\cos(10\pi t - \pi/4)$$

(a) Sketch the spectrum of this signal indicating the complex amplitude of each frequency component. You do not have to make separate plots for real/imaginary parts or magnitude/phase. Just indicate the complex amplitude value at the appropriate frequency.

(b) Is $x(t)$ periodic? If so, what is the smallest period?

(c) Now consider a new signal $w(t) = x(t) - \cos(6t)$. Draw a carefully labelled sketch of the spectrum for $w(t)$. Explain why $w(t)$ is *not* periodic.