Hint*

For the continuous-time periodic signal

$$x(t) = 2 + \cos\left(\frac{2\pi}{3}t\right) + 4\sin\left(\frac{5\pi}{3}t\right),$$

determine the fundamental frequency ω_0 and the Fourier series coefficients a_k such that

$$x(t) = \sum_{k=-\infty}^{\infty} a_k e^{jk\omega_0 t}.$$

our notation is $\displaystyle\sum_{K=-\infty}^{\infty} X[k] e^{jK\omega_F t}$ where $\omega_F = 2\pi f_F$

Hint*

We didn't talk about this in class, but any constant term, like 2, is the "DC term" with the zero-th harmonic, ~~[illegible]~~ i.e. $X[0]$

A continuous-time signal $x(t)$ is real valued and has a fundamental period $T_0 = 8$. Only a few values of $X[k]$ are non-zero; these are

$$X[1] = X[-1] = 2$$

complex conjugate

$$X[3] = X^*[-3] = 4j$$

Express $x(t)$ in the form

$$x(t) = \sum_{k=0}^{\infty} A_k \cos(\omega_k t + \phi_k)$$