Problem 1. Consider mechanical vibrations with mass \( m = 1 \), no damping, and \( k = 2 \). The external force is \( F_0(t) = 3 \sin(\omega t) \). Find \( \omega \) such that there is a resonance.

Problem 2. Consider an electrical circuit with

\[
C = 1, \quad R = 0, \quad L = 1, \quad E_0(t) = 3 \cos(2t).
\]

Find the general solution.