EXERCISE 2.9: Demonstrate that a complex exponential signal can also be a solution to the tuning-fork differential equation:

$$\frac{d^2x}{dt^2} = -\frac{k}{m}x(t)$$

By substituting z(t) and $z^*(t)$ into both sides of the differential equation, show that the equation is satisfied for all t by both of the signals

$$z(t) = Xe^{j\omega_0 t}$$
 and $z^*(t) = X^*e^{-j\omega_0 t}$

Determine the value of ω_0 for which the differential equation is satisfied.

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