

1) a) Find the critical damping, c , for the system:

$$(1) \quad y'' + cy' + 64y = 0$$

b) Find the general solution to (1) in the case when c is the critical damping constant found in (a).

2) a) Is the system:

$$(2) \quad y'' + 10y' + 9y = 0$$

overdamped, underdamped, or critically damped?

b) Find the general solution to (2).

c) Solve the (IVP):

$$\begin{cases} y'' + 10y' + 9y = 0 \\ y(0) = 0.16 \\ y'(0) = 0 \end{cases}$$

3) Consider

$$(3) \quad y'' + 16y = \cos(\omega t)$$

What frequency ω produces resonance? Find the general solution ~~in the case~~ for ~~the~~ (3) in ~~the case~~ the case of resonance.