Question

An oscillator is described by the equations

$$\dot{x} = v \qquad 16\dot{v} = -8v - x$$

Calculate the solution of the equation and sketch the graphs of $x(t)$ for the following initial conditions

1. $x(0) = 4 \quad v(0) = 0$

2. $x(0) = 4 \quad v(0) = -5$

Determine whether the system, under-damped, critically damped or over-damped.

Answer