Given $F = -K\frac{dx}{dt}$.

By 2nd law of motion

$$m\frac{d^2x}{dt^2} = -K\frac{dx}{dt}$$

$$\frac{d^2x}{dt^2} + \omega^2\frac{dx}{dt} = 0 \qquad \omega^2 = K/m$$

Put $\frac{dx}{dt} = P$

$$\frac{dP}{dt} + \omega^2 P = 0 \Rightarrow \quad P = Ce^{-\omega^2 t}$$ C is constant

Now $\frac{dx}{dt} = Ce^{-\omega^2 t}$

$$x = \frac{Ce^{-\omega^2 t}}{-\omega^2} + C_2$$

$$x = \frac{V_0}{\omega^2}\left(1 - e^{-\omega^2 t}\right)$$ final expression