

$$[v(t)] = \left[ \frac{mg}{\beta} \right] \quad (1)$$

$$= \frac{m}{s} = \frac{kg \cdot m}{s^2 \cdot [\beta]} \quad (2)$$

$$\Leftrightarrow [\beta] = \frac{kg}{s} \quad (3)$$

$$x(t) = x_0 + \int v(t) dt \quad (4)$$

$$= x_0 - t \frac{mg}{\beta} - \left( \frac{mg}{\beta} + v_0 \right) \cdot \frac{m}{\beta} \cdot e^{-\frac{\beta}{m}t} \quad (5)$$

$$a = \ddot{x} = \dot{v} = -\frac{\beta}{m} \cdot \left( \frac{mg}{\beta} + v_0 \right) \cdot e^{-\frac{\beta}{m}t} \quad (6)$$

$$F = ma = -\beta \left( \frac{mg}{\beta} + v_0 \right) e^{-\frac{\beta}{m}t} \quad (7)$$