

Exercise 9-18

$$\omega^2 = \omega_0^2 + 2\alpha\theta$$

$$\therefore (3.20 \times 10^4)^2 = 0^2 + 2\alpha(2.13 \times 10^6)$$

$$\therefore \alpha = 2.404 \times 10^4 \text{ rad/s}^2$$

Then, $\omega_1 = \omega_0 + \alpha t_1$

$$\therefore t_1 = \frac{\omega_1 - \omega_0}{\alpha} = \frac{(7.55 \times 10^4) \text{ rad/s}}{2.404 \times 10^4 \text{ rad/s}^2} = 3.14 \text{ s}$$