

Exercise 9-13

$$\text{Total } \Delta\theta = 2\pi \text{ rad}$$

$$\text{Total } \Delta\theta = \omega_1 \Delta t + \omega_2 \Delta t$$

$$\therefore 2\pi = 1.67 \times 10^{-3} \Delta t + 3.33 \times 10^{-3} \Delta t$$

$$\Rightarrow \Delta t = 1.257 \times 10^3 \text{ s} \times \frac{1 \text{ min}}{60.0 \text{ s}}$$

$$= 20.9 \text{ min.}$$