

20. (a) We obtain

$$\omega = \frac{(33.33 \text{ rev/min})(2\pi \text{ rad/rev})}{60 \text{ s/min}} = 3.49 \text{ rad/s} .$$

(b) Using Eq. 11-18, we have

$$v = r\omega = (15)(3.49) = 52 \text{ cm/s} .$$

(c) Similarly, when  $r = 7.4 \text{ cm}$  we find  $v = r\omega = 26 \text{ cm/s}$ . The goal of this exercise to observe what is and is not the same at different locations on a body in rotational motion ( $\omega$  is the same,  $v$  is not), as well as to emphasize the importance of radians when working with equations such as Eq. 11-18.