

$$V = r\omega$$

ω (must be in Radian/Time)

~~50~~ 50 rev/min = ω

$$V = 100 \text{ mi/hour}$$

First put ω in terms of Rad/min

$$\frac{50 \cancel{\text{rev}}}{\text{min}} \cdot \frac{2\pi}{1 \cancel{\text{rev}}} = \frac{100\pi}{\text{min}}$$

Next put $\frac{100\pi}{\text{min}}$ in terms of hour

$$\frac{100\pi}{\cancel{\text{min}}} \cdot \frac{60 \cancel{\text{min}}}{1 \text{ hour}} = \frac{6000\pi}{\text{hour}}$$

Now we solve $V = r\omega$ for r

$$\frac{6000\pi}{\text{hour}} \cdot r = \frac{100 \text{ mi}}{\text{hour}}$$

$$\frac{\cancel{1 \text{ hour}}}{6000\pi} \cdot \frac{6000\pi}{\cancel{\text{hour}}} \cdot r = \frac{100 \text{ mi}}{\cancel{\text{hour}}} \cdot \frac{1 \text{ hour}}{6000\pi}$$

$$r = \frac{100 \text{ mi}}{6000\pi} \approx .0523 \text{ mi}$$

$$.0523 \text{ mile} \cdot \frac{5280 \text{ ft}}{1 \text{ mile}} \cdot \frac{12 \text{ inches}}{1 \text{ foot}} = 3313.72 \text{ inches}$$

276.14 ft 50m
1/27/21