

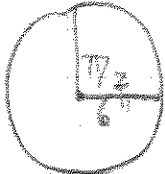



Unit #5 PW#2 Linear + Angular Speed

①  $\frac{4\pi \text{ ft}}{1 \text{ rev}} \cdot \frac{180 \text{ rev}}{1 \text{ min}} = \boxed{720\pi \text{ ft/min}}$
 $C = 4\pi \text{ ft}$

②  a) $\frac{30\pi \text{ in}}{1 \text{ rev}} \cdot \frac{3 \text{ rev}}{1 \text{ sec}} = \boxed{90\pi \text{ in/sec}}$


$C = 30\pi \text{ in}$ b) $\frac{90\pi \text{ in}}{1 \text{ sec}} \cdot \frac{60 \text{ sec}}{1 \text{ min}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} \cdot \frac{1 \text{ ft}}{12 \text{ in}} \cdot \frac{1 \text{ mile}}{5280 \text{ ft}} = \frac{\text{miles}}{\text{hr}}$
 $= \boxed{16.06 \text{ mph}}$


③  Method I:
 a) $\Delta = r\theta$
 $\Delta = 6 \left(\frac{\pi}{2}\right)$
 $\Delta = 3\pi \approx 9.42 \text{ in}$

b)  $\frac{25}{60} = \frac{x}{360}$
 $x = 150$
 $\theta = \frac{5\pi}{6}$
 $\Delta = 6 \left(\frac{5\pi}{6}\right) = 5\pi \text{ in}$
 $\approx 15.71 \text{ in}$

 $12\pi \text{ in} \left(\frac{1}{4}\right)$
 $C = 12\pi \text{ in} = \boxed{3\pi \text{ in}}$

$12\pi \text{ in} \left(\frac{5}{12}\right)$
 $= \boxed{5\pi \text{ in}}$

④  $\Delta = 40 \left(\frac{\pi}{9}\right) \text{ in}$
 $= \boxed{\frac{40\pi}{9} \text{ in}}$
 $\frac{20}{180} = \frac{x}{\pi}$
 $x = \frac{\pi}{9}$

⑤  $C = 16\pi \text{ in}$ $C = 4\pi \text{ in}$
 $16\pi \text{ in}(x) = 4\pi \text{ in}(3)$
 $16\pi \text{ in}(x) = 12\pi \text{ in}$
 $x = \frac{3}{4} \text{ of a revolution}$

6



$$C = 60\pi \text{ ft}$$

$$a) \frac{1 \text{ rev}}{70 \text{ sec}} \cdot \frac{60\pi \text{ ft}}{1 \text{ rev}} = \frac{60\pi \text{ ft}}{70 \text{ sec}} = \frac{6\pi \text{ ft}}{7}$$

$$\approx 2.69 \text{ ft/sec}$$

$$b) \frac{1 \text{ rev}}{70 \text{ sec}} \cdot \frac{2\pi \text{ rad}}{1 \text{ rev}} = \frac{2\pi \text{ rad}}{70 \text{ sec}} = \frac{\pi}{35} \text{ rad/sec}$$

$$\approx .09 \text{ rad/sec}$$

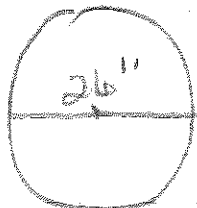
7



$$C = 8\pi \text{ ft}$$

$$\frac{8\pi \text{ ft}}{1 \text{ rev}} \cdot \frac{1 \text{ mile}}{5280 \text{ ft}} \cdot \frac{10 \text{ rev}}{1 \text{ mi}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} = 2.86 \text{ mph}$$

8



$$C = 26\pi \text{ in}$$

$$a) \frac{26\pi \text{ in}}{1 \text{ rev}} \cdot \frac{480 \text{ rev}}{1 \text{ min}} \cdot \frac{60 \text{ min}}{1 \text{ hr}} \cdot \frac{1 \text{ ft}}{12 \text{ in}} \cdot \frac{1 \text{ mile}}{5280 \text{ ft}} = 37.13 \text{ mph}$$

$$b) \frac{80 \text{ miles}}{1 \text{ hr}} \cdot \frac{12 \text{ in}}{1 \text{ ft}} \cdot \frac{5280 \text{ ft}}{1 \text{ mile}} \cdot \frac{1 \text{ rev}}{26\pi \text{ in}} \cdot \frac{1 \text{ hr}}{60 \text{ min}} = 1034.26 \frac{\text{rev}}{\text{min}}$$

9



$$C = 8.5\pi \text{ ft}$$

$$\frac{9.55 \text{ miles}}{1 \text{ hr}} \cdot \frac{1 \text{ rev}}{8.5\pi \text{ ft}} \cdot \frac{5280 \text{ ft}}{1 \text{ mile}} \cdot \frac{1 \text{ hr}}{60 \text{ min}} = 31.47 \text{ rev/min}$$