

Unit #5 Lesson #3 WS#1

1) a) $\frac{65 \text{ miles}}{1 \text{ hr}} \cdot \frac{5280 \text{ ft}}{1 \text{ mile}} \cdot \frac{1 \text{ rev}}{4\pi \text{ ft}} \cdot \frac{1 \text{ hr}}{60 \text{ min}}$

$C = 4\pi \text{ ft}$

$= 455.18 \text{ rev/min}$

b) $\frac{455.18 \text{ rev}}{1 \text{ min}} \cdot \frac{2\pi \text{ rad}}{1 \text{ rev}} = 2859.98 \text{ rad/min}$

$\frac{455.18 \text{ rev}}{1 \text{ min}} \cdot \frac{4\pi \text{ ft}}{1 \text{ rev}} = 5719.96 \text{ ft/min}$

2) a) $\frac{1.2 \text{ rev}}{1 \text{ sec}} \cdot \frac{2\pi \text{ rad}}{1 \text{ rev}} = 2.4\pi \text{ rad/sec} = 7.54 \text{ rad/sec}$

$C = 30\pi \text{ in}$

b) $\frac{1.2 \text{ rev}}{1 \text{ sec}} \cdot \frac{30\pi \text{ in}}{1 \text{ rev}} = 36\pi \text{ in/sec}$

3) a) $C = 120\pi \text{ in}$

$C = 40\pi \text{ in}$
 $\frac{48 \text{ rev}}{\text{min}}$

Should run same distance (on the same belt), but not with same number of revolutions. Hence

$$120\pi(x) = 40\pi(48)$$

$x = 16 \text{ revolutions for big pulley}$

$$b) \frac{2\pi \text{ rad}}{1 \text{ rev}} \cdot \frac{48 \text{ rev}}{1 \text{ min}} = 96\pi \text{ rad/min} \\ \approx 301.59 \text{ rad/min}$$

$$c) \frac{2\pi \text{ rad}}{1 \text{ rev}} \cdot \frac{16 \text{ rev}}{1 \text{ min}} = 32\pi \text{ rad/min} \\ \approx 100.53 \text{ rad/min}$$

$$d) \frac{40\pi \text{ cm}}{1 \text{ rev}} \cdot \frac{48 \text{ rev}}{1 \text{ min}} = 1920\pi \text{ cm/min} \\ \approx 6031.86 \text{ cm/min}$$

20

$C = 40\pi \text{ cm}$