

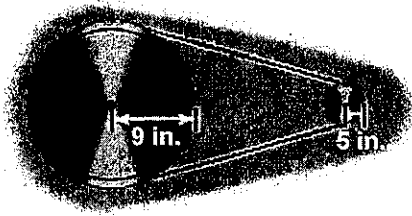
Student: _____
Date: _____

Instructor: Joe Better's

Course: Pre-Calculus Pre AP (Master Course)

Assignment: 6.1 Classwork Day 2

1.



Two pulleys, one with radius 5 inches and one with radius 9 inches, are connected by a belt. If the 5-inch pulley is caused to rotate at 7 revolutions per minute, determine the revolutions per minute of the 9-inch pulley. (Hint: The linear speeds of the pulleys are the same, both equal the speed of the belt.)

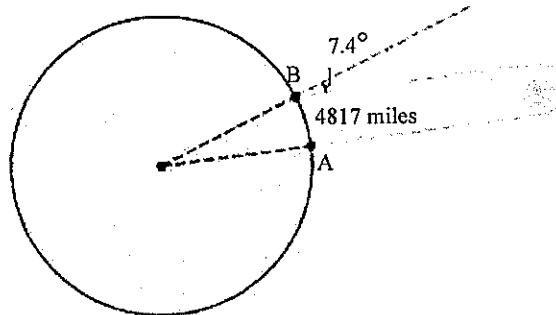
The 9-inch pulley rotates at

_____ $\frac{\text{revolutions}}{\text{minute}}$
(Type an integer or a fraction.)

2. At a museum you can see the four cable lines that are used to pull cable cars up and down a hill. Each cable travels at a speed of 9.45 miles per hour, caused by a rotating wheel whose diameter is 8.5 feet. How fast is the wheel rotating? Express your answer in revolutions per minute.

The angular speed of the wheel is _____ rev/min.
(Round to two decimal places as needed.)

3. A sun's rays are vertical at the point A on a planet. At the point B, which is 4817 miles due north of A, the angle of the sun measured to be 7.4° . See the figure. Use this information to approximate the radius and circumference of the planet.



The radius of the planet is approximately _____ miles.
(Round to the nearest integer as needed.)

The circumference of the planet is approximately _____ miles.
(Round to the nearest integer as needed.)

1. $\frac{35}{9}$

2. 31.14

3. 37,296
234,341

6.1 classwork day 2

$$\textcircled{1} \quad v_1 = r_1 \omega_1 \quad v_2 = r_2 \omega_2$$

$$r_1 \omega_1 = r_2 \omega_2$$

$$9 \omega_1 = 5(7 \text{ rev})$$

$$\omega_1 = \frac{35}{9} \text{ rev/min}$$

$$\textcircled{2} \quad d = 8.5 \text{ ft diameter}$$

$$r = 4.25 \text{ ft radius}$$

$$v = 9.45 \text{ miles/hour}$$

$$\omega = \frac{v}{r} = \frac{9.45 \text{ miles/hr}}{4.25 \text{ ft}}$$

$$\begin{aligned} * 1 \text{ rev} &= 2\pi \text{ rad} \\ * 5280 \text{ ft} &= 1 \text{ mile} \end{aligned}$$

* Convert

$$\frac{9.45 \text{ miles}}{1 \text{ hr}} \cdot \frac{1}{4.25 \text{ ft}} \cdot \frac{5280 \text{ ft}}{1 \text{ mile}} \cdot \frac{1 \text{ hr}}{60 \text{ min}} \cdot \frac{1 \text{ rev}}{2\pi}$$

$$31.14 \text{ rev/min}$$

6.1 classwork day 2 continued

③ $S = 4817$

7.4° angle $\rightarrow 7.4(\pi/180)$ radians

$$S = r\theta$$

$$4817 = r \left(\frac{7.4\pi}{180} \right)$$

* $r = 37296.45539$ miles

$r = 37296$ miles rounded

$$C = 2\pi r$$

* $C = 2\pi \left(\frac{(4817)(180)}{7.4\pi} \right) = 234340.5405$ miles

$C = 234341$ miles rounded