

Name \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

1. If each angle has the given measure in standard position, sketch the angle in standard form. Then determine the quadrant that the terminal side lies in. DO NOT CONVERT!

a.  $\frac{7\pi}{12}$  Quadrant \_\_\_\_\_      b.  $-156^\circ$  Quadrant \_\_\_\_\_      c.  $1000^\circ$  Quadrant \_\_\_\_\_

d.  $\frac{14\pi}{5}$  Quadrant \_\_\_\_\_      e.  $-861^\circ$  Quadrant \_\_\_\_\_      f.  $\frac{18\pi}{15}$  Quadrant \_\_\_\_\_

2. Change each degree measure to radian measure in terms of  $\pi$ .

a.  $-250^\circ$  \_\_\_\_\_      b.  $145^\circ$  \_\_\_\_\_      c.  $870^\circ$  \_\_\_\_\_      d.  $345^\circ$  \_\_\_\_\_

3. Change each radian measure to a degree measure.

a.  $\frac{3\pi}{16}$  \_\_\_\_\_      b.  $-2.56$  \_\_\_\_\_      c.  $-\frac{7\pi}{9}$  \_\_\_\_\_      d.  $12.85$  \_\_\_\_\_

4. Find one positive and one negative angle that are coterminal with the given angle.

a.  $70^\circ$  \_\_\_\_\_ & \_\_\_\_\_      b.  $-\frac{2\pi}{5}$  \_\_\_\_\_ & \_\_\_\_\_      c.  $-302^\circ$  \_\_\_\_\_ & \_\_\_\_\_

d.  $\frac{3\pi}{4}$  \_\_\_\_\_ & \_\_\_\_\_      e.  $\frac{17\pi}{24}$  \_\_\_\_\_ & \_\_\_\_\_      f.  $-546^\circ$  \_\_\_\_\_ & \_\_\_\_\_

5. Write an expression for all angles that are coterminal with:

a.  $78^\circ$  \_\_\_\_\_

b.  $\frac{53\pi}{85}$  \_\_\_\_\_

6. Sketch. Then find the reference angle.

a.  $\frac{22\pi}{5}$  \_\_\_\_\_

b.  $-235^\circ$  \_\_\_\_\_

c.  $\frac{98\pi}{23}$  \_\_\_\_\_

7. The minute hand of a clock is 6 inches long. How far does the tip of the minute hand move in 25 minutes?

Radius = \_\_\_\_\_ angle formed at 25 minutes = \_\_\_\_\_

\_\_\_\_\_

8. A pendulum swings through an angle of  $20^\circ$  each second. If the pendulum is 40 inches long, how far does its tip move each second?

Radius = \_\_\_\_\_ angle = \_\_\_\_\_

\_\_\_\_\_

9. An object is traveling around a circle with radius 2 meters. If in 20 seconds the object travels 5 meters then

a) What is the angular speed? \_\_\_\_\_

b) What is the linear speed? \_\_\_\_\_

\_\_\_\_\_

10. The diameter of each wheel of a bicycle is 26 inches. If you are traveling at a speed of 35 miles per hour on this bicycle, through how many revolutions per minute are the wheels turning?

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11. The radius of each wheel of a car is 15 inches. If the wheels are turning at a rate of 3 revolutions per second, how fast is the car moving in miles per hour?

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12. To approximate the speed of a current of a river, a circular paddle wheel with radius 4 feet is lowered into the water. If the current causes the wheel to rotate at a speed of 10 revolutions per minute, what is the speed of the current in miles per hour?

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13. The spin balancer rotates the wheel of a car at 480 revolutions per minute. If the diameter of the wheel is 26 inches:

a) What road speed is being tested in miles per hour? \_\_\_\_\_

b) At how many revolutions per minute should the balancer be set to test a road speed of 80 miles per hour?

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14. At the Cable Car Museum you can see the four cable lines that are used to pull cable cars up and down the hills of San Francisco. Each cable travels at a speed of 9.55 miles per hour, caused by a rotating wheel whose diameter is 8.5 feet. How fast is the wheel rotating in revolutions per minute?

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