Pre-Calculus Unit 4 review

Name _____ Date _____ Period _____

Convert the angle given from degrees to radians. Leave as a multiple of π. Show work!

1. $-36°$

2. $20°$

Convert the angle given from radians to degrees. Round to the nearest tenth of a degree. Show work!

3. $\dfrac{3\pi}{4}$

4. $\dfrac{7\pi}{6}$

Find the length of the arc intercepted by the given central angle α in a circle with radius r. Round answers to the nearest hundredth. Show work!

5. $\alpha = \dfrac{5\pi}{6}$, $r = 2.1\,cm$

Find the area of a sector of a circle with the given central angle α and the given radius r of the circle. Round answers to the nearest hundredth. Show work!

6. $\alpha = 35°$, $r = 6\,m$

Find the measure of two angles, one positive and one negative that are conterminal with the given angle.

7. $\dfrac{3\pi}{8}$

8. $-62°$

9. A wheel with a 13 inch diameter is turning at the rate of 22 revolutions per minute. Find the linear velocity of a point on the rim of the wheel in miles per hour. Round answer to nearest hundredth. (1 mile = 5280 feet)

Find the exact values of $\sin\alpha, \cos\alpha, \tan\alpha, \csc\alpha, \sec\alpha, \text{ and } \cot\alpha$ **where** α **is an angle in standard position whose terminal side contains the given point.**

10. $(-4, 5)$

Evaluate each expression without using a calculator. Give the result in degrees.

11. $\tan^{-1}\left(-\dfrac{1}{\sqrt{3}}\right)$

12. $\cos^{-1}\left(-\dfrac{1}{2}\right)$

Sketch the angle in standard position and name the quadrant in which the terminal side lies.

13. $\dfrac{3\pi}{8}$

Find the exact value of the expression. Do not use a calculator.

14. $\cos a, \ if \ \sin a = -\dfrac{3}{5} \ and \ \tan a > 0$

Find the equation for the curve in its final position. Pay attention to the order of the transformations!

15. The graph y = sin (x) is shifted a distance of $\dfrac{\pi}{4}$ to the left, reflected over the x-axis, stretched vertically by a factor of 3, and then translated 5 units upward.

Solve the <u>right triangle</u> using only the given sides and angles to find each missing part. Make a sketch. Round approximate answers to the nearest hundreth.

16. $\beta = 13.7°,\ a = 1.5$

Solve the following problem.

17. At an altitude of 1500 feet, the engine on a small plane fails. What angle of depression is needed to reach an airport runway that is 13000 feet away by land? (Round your answer to the nearest tenth of a degree.)

Graph the function over a one-period interval. Clearly label your axes. Label or list the five key points on the graph. List the amplitude, period, phase shift, and range.

18. $y = 2\sin\left[2\pi\left(x - \frac{1}{2}\right)\right] - 1$
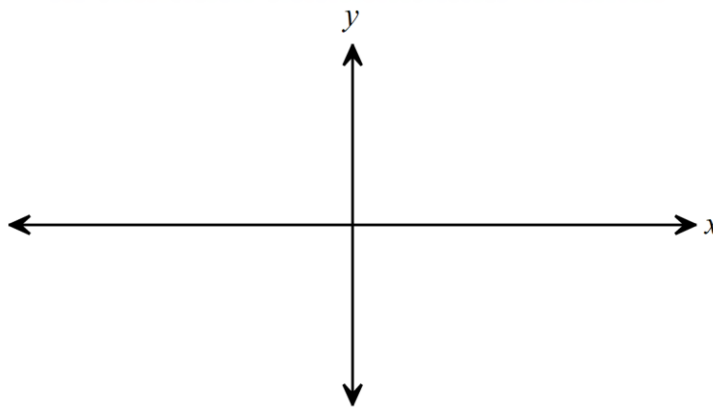
Amplitude: _____

Period: _____

Phase shift: _____

Vertical shift: _____

Range: _____

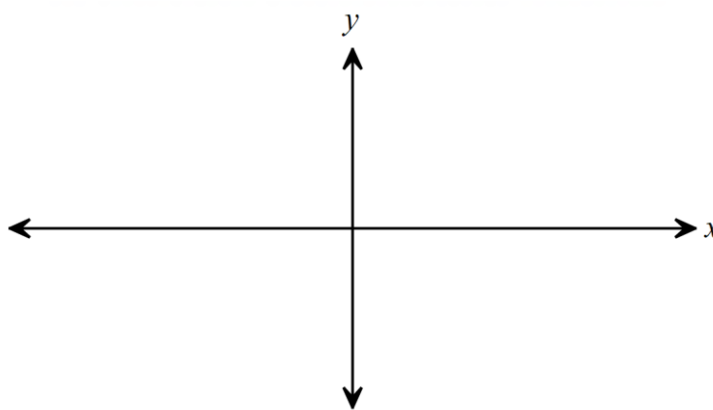**Find the equations of the asymptotes.**

19. $y = 3 \, csc\left(\frac{1}{4}x - \frac{\pi}{3}\right)$

Graph the function. Label or list the key points. List the period and the equations of the asymptotes.

20. $y = -\frac{2}{3} tan(x)$

Period _____

Asymptotes _____

Solve the problem.

21. The voltage E in an electrical circuit is given by $E = 4 \cos 30\pi t$ where t is time measured in seconds. Find the frequency of the function (that is, find the number of cycles or periods completed in one second.)

22. **Determine an equation of the function that is graphed in the form y = a sin[b(x-c)] + d.**