

Pre Calculus
Unit 6: Study Guide

1) Change each radian to degrees. Change each degree to radians (leave the radians in terms of π).

a) 15°

b) $\frac{\pi}{5}$

2) Evaluate the following:

a) $\sin \frac{11\pi}{3}$

b) $\tan \left(-\frac{10\pi}{3} \right)$

3) List the transformations of each function then graph. Make sure you label your axes.

a) $y = 2 \sec(\theta - \pi) - 2$

b) $y = \tan \left(2\theta + \frac{\pi}{4} \right)$

c) $y = -\cot(\theta) + 2$

d) $y = -3\sin \left(\frac{\theta}{2} - \pi \right)$

4) Write an equation given the following information.

a) Cotangent Function, period = 3π ,
phase shift = $-\frac{2\pi}{3}$, vertical shift = -2

b) Cosecant Function, period = $\frac{2\pi}{3}$,
phase shift = 4π , vertical shift = $\frac{1}{2}$, Reflection
across midline

5) Find each value.

a) $\cos\left(\sin^{-1}\left(-\frac{\sqrt{3}}{2}\right)\right)$

b) $\arcsin\frac{1}{2}$

6) Write the formula(s) for the following:

a) Arc Length

b) Sector Area

7) A pet gerbil runs the length of an arc on a circular wheel with diameter 25cm. The gerbil creates an arc length at a 40° angle. What length did the gerbil travel?

8) A sprinkler system has three types of sprinkler heads: a quarter circle, a semicircle, and a full circle. The sprinkler will spray a distance of 15 feet from the sprinkler head.

a) What is the area of the sector that will be watered by the quarter circle sprinkler head?

b) What is the area of the sector that will be watered by the semicircle sprinkler head?

9) Write the formula(s) for the following:

a) Linear Velocity

b) Angular Velocity

10) A Ferris wheel with a radius of 45 feet rotates at a speed of 2.5 revolutions per minute. Find the angular velocity, in radians per minute, and the linear velocity, in miles per hour, of a point on the outer edge of the Ferris wheel. (1 mile = 5280 feet)