

DO NOT TURN THIS PAGE UNTIL YOU ARE INSTRUCTED TO DO SO

- ❖ Write your name below on the space provided.
- ❖ This test has a total of 5 pages.
- ❖ Work the problem in the space provided. If you need more space, write on the back of the test.
- ❖ To insure maximum credit, show your work. In general, full credit will not be given for unsupported answers.
- ❖ Be sure to write neatly. All tests must be done in pencil. If I cannot read what was written or it was not done in pencil, do not expect the problem to be graded.
- ❖ If you finish early, go over the test again.

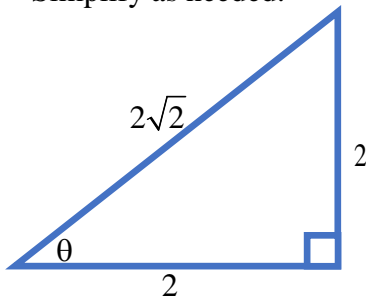
Good luck!

Number	Maximum	Score
1	8	
2	2	
3	6	
4	6	
5	7	
6	6	
7	9	
8	9	
9	7	
10	3	
11	12	
12	12	
13	13	
Total	100	

Name \_\_\_\_\_

**CIRCLE FINAL ANSWERS**

- 1) (8 points) For the right triangle below, find the six trigonometric functions for the angle  $\theta$ . Simplify as needed.



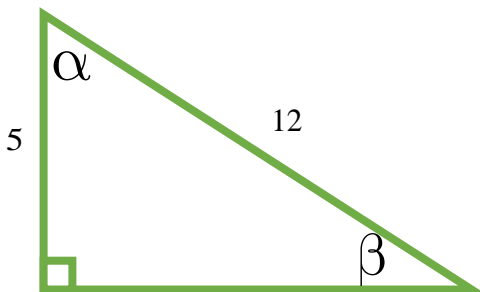
$$\begin{array}{ll} \sin \theta = & \csc \theta = \\ \cos \theta = & \sec \theta = \\ \tan \theta = & \cot \theta = \end{array}$$

- 2) (2 points) What is the measurement of the angle  $\theta$  from number 1? \_\_\_\_\_

- 3) (1 point each) Fill in the blank:

- a) The sine function is \_\_\_\_\_ to cosine but \_\_\_\_\_ to cosecant.  
 b) The cosine function is \_\_\_\_\_ to sine but \_\_\_\_\_ to secant.  
 c) The tangent function is \_\_\_\_\_ and \_\_\_\_\_ to cotangent.

- 4) (6 points) For the right triangle below, find the missing angles **by using only the numbers given**. Do not find  $\beta$  from  $\alpha$  or vice versa. Round answers to two decimal places:



$$\alpha =$$

$$\beta =$$

- 5) (7 points) Standing right next to each other, two students hear Mike announce a test and begin to run away in different directions. The first student runs on a bearing of  $S35.5^\circ E$  at a speed of 5.2 feet per second. The second student runs on a bearing of  $S54.5^\circ W$  at a speed of 6.7 feet per second. After 12 seconds, how far apart are the students? Round answer to two decimal places.

6) (6 points) Standing at the edge of a cliff and looking up  $41.7^\circ$ , you see a hot air balloon 357 feet away. Looking down  $23.8^\circ$ , and directly below the hot air balloon, you see a lonely hot dog vendor. How far above the hot dog vendor is the hot air balloon?

7) (9 points) For the angle  $\theta$  in Quadrant III where  $\tan \theta = \frac{5}{8}$ , find the 5 other trig functions:

$$\sin \theta = \qquad \qquad \qquad \csc \theta =$$

$$\cos \theta = \qquad \qquad \qquad \sec \theta =$$

$$\tan \theta = \qquad \qquad \qquad \cot \theta =$$

8) (3 points each) Convert as directed. Show all necessary work:

a)  $18.645^\circ$  to DMS notation:      b)  $12^\circ$  to radians:      c)  $\frac{13\pi}{12}$  to degrees:

9) (7 points) A Ferris wheel pulled by bad, bad students that do not do their homework rotates at a rate of 8.75 revolutions per minute. The diameter of the Ferris wheel is 36.8 feet. Determine how fast a point on the tip of the Ferris wheel is traveling in miles per hour. Round to three decimal places.



There's  
5,280 ft in  
a mile.  
For reals!

10) (3 points) Short answer: Explain why the functions tangent, cotangent, secant, and cosecant have vertical asymptotes:

11) (1 point per box) Fill in the blank with the words “even” or “odd” to describe the type of function and then the correct value for the period:

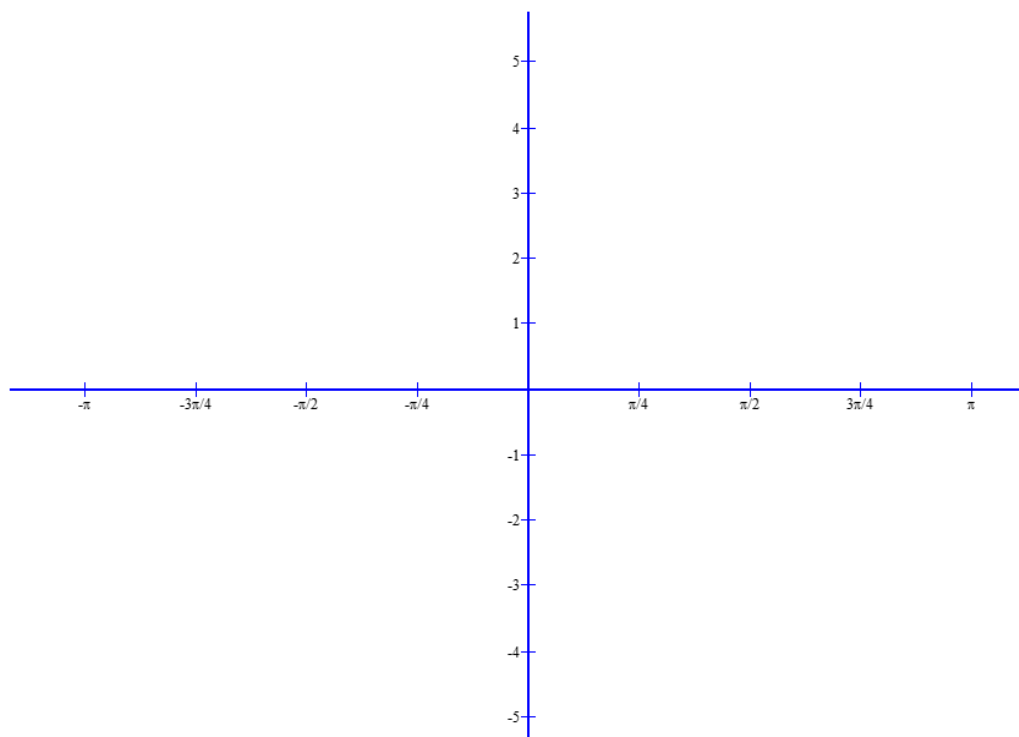
	Type of Function	Period		Type of Function	Period
Sine			Cosecant		
Cosine			Secant		
Tangent			Cotangent		

12) (3 points each) Given the point  $\left(\frac{5\pi}{3}, -\frac{\sqrt{3}}{2}\right)$  on the graph of  $y = f(\theta)$ , find the **exact value** of the coordinates of the point under the transformation below:

- a)  $y = 4f(\theta)$       b)  $y = f(\theta) + 2$       c)  $y = f(4\theta)$       d)  $y = f(\theta - \pi)$

13) (10 points part a; 3 points each part b) For the function  $y = -3\cos\left(\theta - \frac{\pi}{4}\right) + 1$ :

a) Sketch a graph of the function below.  
Fill in the whole axis from  $[-\pi, \pi]$ :



b) Determine the following:  
i) Domain

ii) Range

iii) Amplitude

iv) Phase Shift

v) Period

# Chapter 6 Formulas

Arc Length:  $s = r\theta$

Linear Speed:  $v = \frac{s}{t}$

Angular Speed:  $\omega = \frac{\theta}{t}$

Linear Speed:  $v = r\omega$

in terms of radius and angular speed

Practice Graphs Below—Copy Final Graph to Test

