

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. Feel free to tear off the last page. I do not need it returned.
- ❖ Work the problem in the space provided. If you need more space, write on the back of the test. Be sure to mark on the test that work is continued on the back. Be sure to number your work.
- ❖ 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.

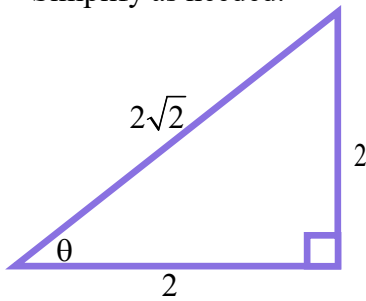
Good luck!

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 θ . Simplify as needed.



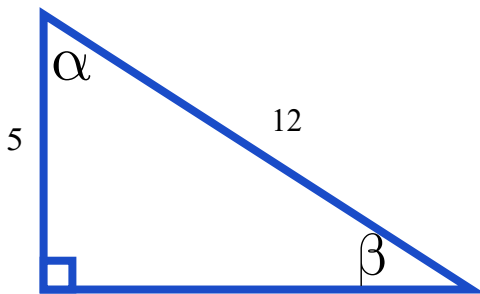
$$\begin{array}{ll} \sin \theta = & \csc \theta = \\ \cos \theta = & \sec \theta = \\ \tan \theta = & \cot \theta = \end{array}$$

- 2) (2 points) What is the measurement of the angle θ 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 β from α 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 4.8 feet per second. The second student runs on a bearing of $S54.5^\circ W$ at a speed of 5.2 feet per second. After 10 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° , you see a hot air balloon 357 feet away. Looking down 23.8° , 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 θ 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° to DMS notation: b) 12° 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 38.6 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
Sine		
Cosine		
Tangent		

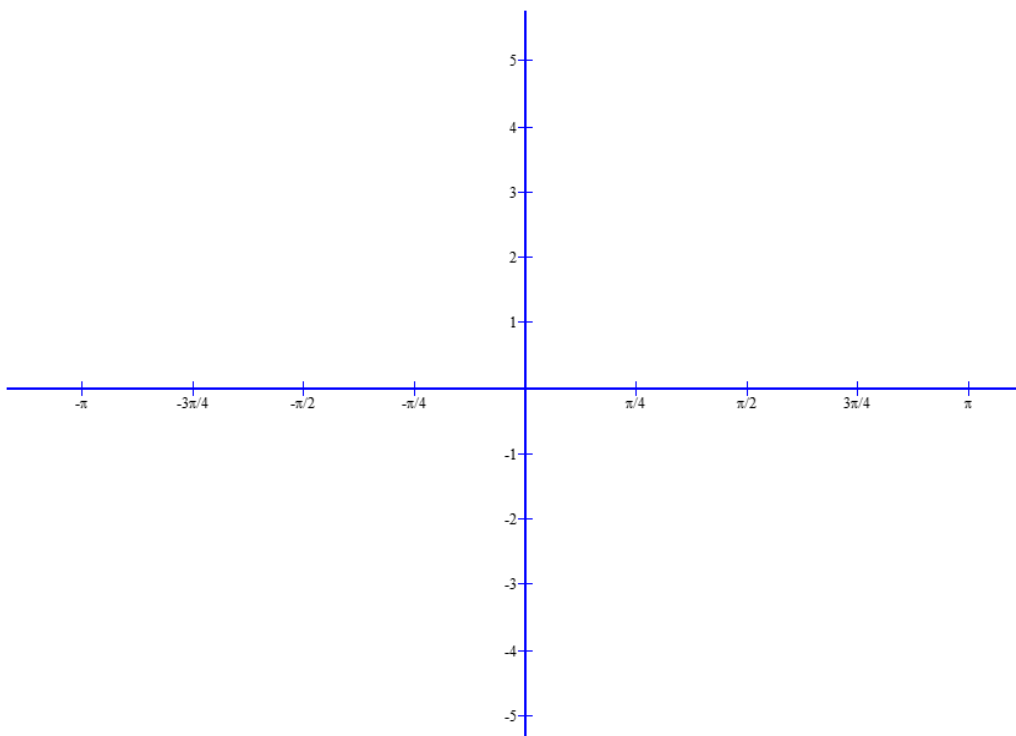
	Type of Function	Period
Cosecant		
Secant		
Cotangent		

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

