MATH 1540 Fall 2016 Mike McCraith
Exam 1 September 27, 2016

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.
- Look only at your test. Don't give me the impression that you are cheating.
- Be sure to write neatly. If I cannot read what was written, do not expect the problem to be graded.
- If you finish early, go over the test again.

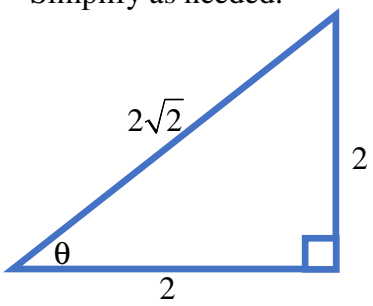
Good luck!

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 α. Simplify as needed.



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

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

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

2) (2 points) What is the measurement of the angle θ from number 1? _____

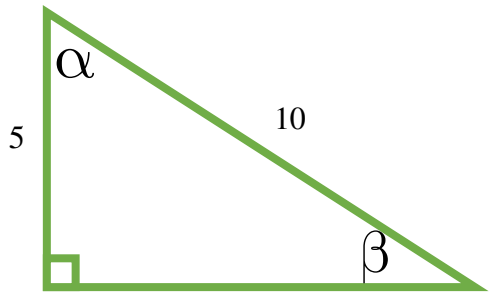
3) (1 point each) Fill in the blank:

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 6.2 feet per second. The second student runs on a bearing of $S54.5^{\circ}W$ at a speed of 4.9 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°, 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:

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

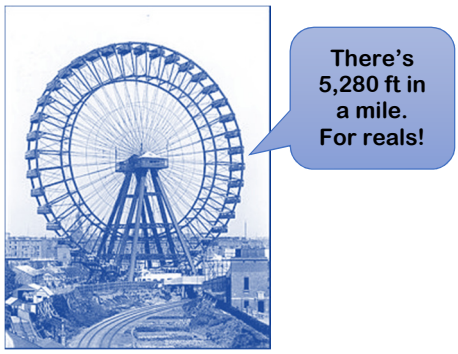
$\cos\theta =$ $\qquad$ $\sec\theta =$

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

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

a) 18.645° to DMS notation: b) 12° to radians: c) $\frac{11\pi}{12}$ to degrees:

9) (7 points) A Ferris wheel pulled by bad, bad students that do not do their homework rotates at a rate of 8.25 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.



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		

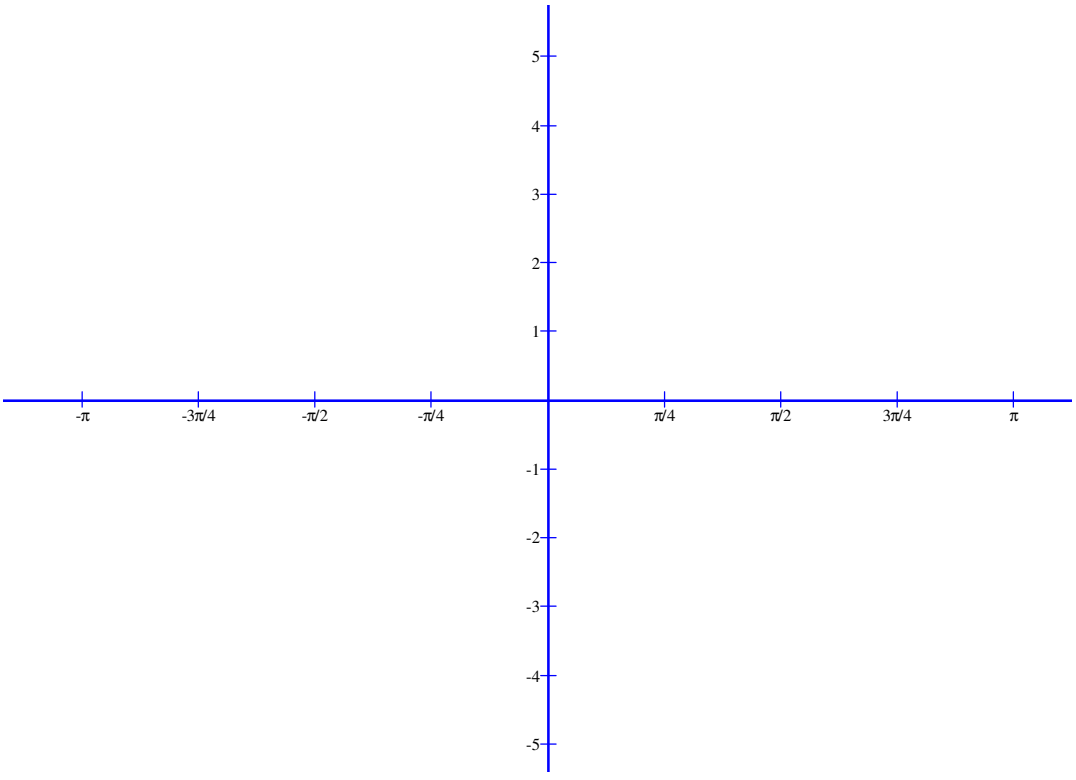
	Type of Function	Period
Cosecant		
Secant		
Cotangent		

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

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

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**