

Math 1160D - Exam 1

Name: _____

Monday, October 6, 2014

Time: 50 minutes

Instructor: Brittany Cuchta

Instructions:

- Do not open the exam until I say you may.
- All cell phones and other electronic noisemaking devices must be turned off or completely silenced (i.e., not on vibrate) for the duration of the exam.
- **No calculators** are allowed on the exam.
- The exam *must* be taken in pencil. Using a pen on the exam will result in the loss of points.
- Failure to follow directions specific to a problem will result in the loss of points.
- Circle or box your final answer where appropriate. Put your final answer in the provided space when available. Failure to do so will result in points being deducted.
- Show **all** work. Full credit will only be given if work is shown which **fully and clearly** justifies your answer. I reserve the right to not grade a problem which I cannot read.
- Answers must be exact (like $\sqrt{2}$), not approximate (like 1.414), unless a problem specifically indicates otherwise.
- All final answers must be simplified unless otherwise specified. **Rationalization is not required unless otherwise specified.**
- If you run out of room, use the back of the page and indicate this on the question.
- As always, you are expected to exhibit academic integrity during the exam.

Page:	1	2	3	4	Total
Points:	30	28	18	24	100
Score:					

1. Convert the following from radians to degrees or degrees to radians.

(a) (3 points) 240°

Solution: _____

(b) (3 points) $-\frac{3\pi}{4}$

Solution: _____

2. (12 points) Complete the following table.

Function	Domain	Range	Period	Even/Odd
$y = \cos \theta$				
$y = \tan \theta$				
$y = \sec \theta$				

3. (6 points) A pendulum swings through an angle of 45° each minute. If the pendulum is 20 inches long, how far does the tip of the pendulum move each minute?

Solution: _____

4. (6 points) What is the exact radius of a circle given an arc length of 4π inches for a central angle of 60° ?

Solution: _____

5. (6 points) You are asked to design a sprinkler which will cover an field of 50yd^2 in the shape of a sector of a circle with radius of 5 yd. Through what angle should the sprinkler rotate?

Solution: _____

6. Find the quadrant which θ lies in given the following information.

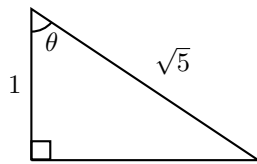
(a) (2 points) $\cot \theta < 0$, $\cos \theta > 0$

Quadrant: _____

(b) (2 points) $\sin \theta > 0$, $\sec \theta < 0$

Quadrant: _____

7. (12 points) Find the values for the six trigonometric functions for the following triangle.



$\sin \theta$	$\cos \theta$	$\tan \theta$	$\csc \theta$	$\sec \theta$	$\cot \theta$

8. (6 points) Find the exact value of the requested trigonometric function of θ given the following information:

$$\cos \theta = -\frac{1}{3}, \quad \frac{\pi}{2} < \theta < \pi$$

$\sin \theta =$ _____

$\tan \theta =$ _____

$\sec \theta =$ _____

9. Solve the following expressions, giving *exact* values for each.

(a) (3 points) $6 \cos \left(-\frac{3\pi}{4} \right) + 2 \tan \left(\frac{\pi}{3} \right)$

(b) (3 points) $\tan \left(-\frac{\pi}{4} \right) + \sin \left(-\frac{\pi}{6} \right)$

(c) (2 points) $\sec^2(29^\circ) - \tan^2(29^\circ)$

(d) (3 points) $\cos(25^\circ) \sin(65^\circ) + \cos(65^\circ) \sin(25^\circ)$

(e) (3 points) $\sin \left(\frac{5\pi}{2} \right) + \cos(3\pi)$

(f) (4 points) $\cos^2 \left(\frac{7\pi}{6} \right) + \sin^2 \left(\frac{7\pi}{6} \right) + \sin^3 \left(\frac{7\pi}{6} \right)$

10. Graph the following function. Be sure to label at least three points and show at least **two full periods**.

$$y = 3 \sin(-2x - \pi) + 2$$

(a) (3 points) What is the amplitude of the function? _____

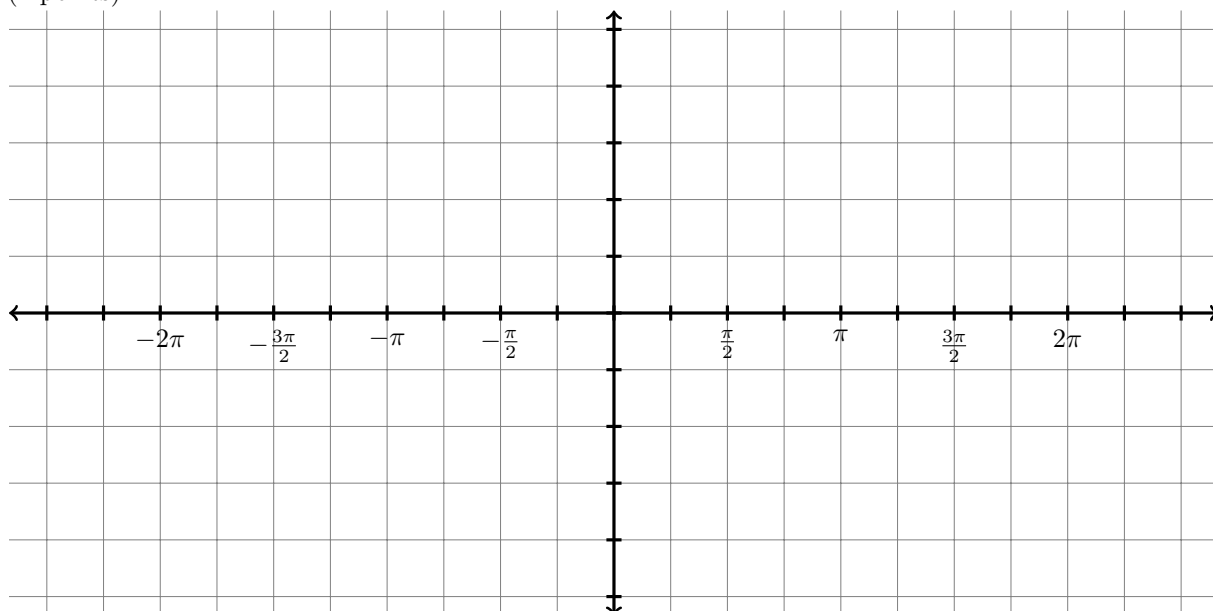
(b) (3 points) What is the period of the function? _____

(c) (3 points) What is the phase shift of the function? _____

(d) (3 points) What is the vertical shift of the function? _____

(e) (4 points) Is the function even or odd? _____

(f) (4 points)



11. (4 points) The equation above is not the only equation that can be used to express this graph. Give another equation that represents the same graph.