

Name (print neatly): \_\_\_\_\_ Score: \_\_\_\_\_ /100  
(106 pts available)

## EXAM 1: Tuesday, February 11, 2014

### Academic Honesty Pledge

*Your signature at the bottom indicates your agreement to abide by the following rules.*

1. All purses, bags, books, notes, and other papers are placed in the back of the room.
2. **All cell phones and other electronic devices are placed in the back of the room.**
3. **Calculators are not permitted on this exam.**
4. I will not communicate with other students during the exam.
5. I will not seek help from or give help to others during the exam.
6. I will turn my exam in and will not take it from the classroom.
7. I will not discuss the exam outside of class with another student who has not yet taken the exam.
8. I will not cheat in any other way.
9. I will follow any other instructions from my professor.

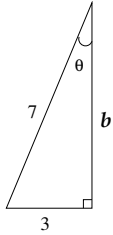
Signature: \_\_\_\_\_

## Exam 1

Show your reasoning for full credit. Use standard notation correctly. Give exact values, simplified.

1. (10 pts) Consider the right triangle pictured. *Figure is not drawn to scale.*

(a) Find  $b$ . Give an exact value, simplified.



(b) Evaluate each of the following. Give exact values, simplified. You need not rationalize denominators.

i.  $\sin \theta =$

iii.  $\tan \theta =$

v.  $\csc \theta =$

ii.  $\cos \theta =$

iv.  $\sec \theta =$

vi.  $\cot \theta =$

2. (10 pts) A tourist is standing 1000 feet from the base of the Eiffel Tower in Paris. She sights the top of the tower and finds the angle of elevation to be  $46.7^\circ$ . Find and simplify an expression for the height  $h$  of the Eiffel Tower.

3. (6 pts)

(a) Convert  $400^\circ$  to radians.

(b) Convert  $\frac{\pi}{36}$  radians to degrees.

4. (5 pts) Find the length  $s$  of an arc of a circle of radius 5 cm associated with an angle of  $\frac{7\pi}{10}$  radians.

5. (15 pts) Consider  $\theta = 330^\circ$ .

(a) Find the reference angle for  $\theta$ .

(b) Find a negative angle coterminal with  $\theta$ .

(c) Sketch  $\theta$  in standard position.

(d) Evaluate each of the following. *Give exact values, simplified. You need not rationalize denominators.*

i.  $\sin 330^\circ =$

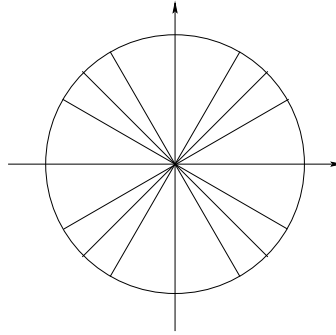
iii.  $\tan 330^\circ =$

v.  $\sec 330^\circ =$

ii.  $\cos 330^\circ =$

iv.  $\cot 330^\circ =$

vi.  $\csc 330^\circ =$



6. (15 pts) Consider  $\theta = -\frac{5\pi}{4}$ .

(a) Find the reference angle for  $\theta$ .

(b) Find a positive angle coterminal with  $\theta$ .

(c) Sketch  $\theta$  in standard position.

(d) Evaluate each of the following. *Give exact values, simplified. You need not rationalize denominators.*

i.  $\sin\left(-\frac{5\pi}{4}\right) =$

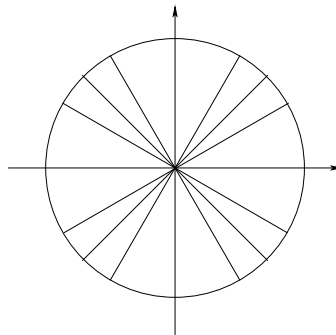
iii.  $\tan\left(-\frac{5\pi}{4}\right) =$

v.  $\sec\left(-\frac{5\pi}{4}\right) =$

ii.  $\cos\left(-\frac{5\pi}{4}\right) =$

iv.  $\cot\left(-\frac{5\pi}{4}\right) =$

vi.  $\csc\left(-\frac{5\pi}{4}\right) =$



7. (25 pts) Consider the function  $f(x) = \cos x$ .

(a)  $\text{dom}(\cos) =$

(b)  $\text{range}(\cos) =$

(c) Is cosine an odd function, an even function, or neither?

(d) Label each of the following on the  $x$ -axis of the coordinate system below.

i.  $2\pi$

iii.  $\frac{\pi}{3}$

v.  $\frac{\pi}{6}$

vii.  $\frac{3\pi}{2}$

ix.  $\frac{3\pi}{4}$

ii.  $\frac{\pi}{2}$

iv.  $\frac{\pi}{4}$

vi.  $-\frac{\pi}{2}$

viii.  $\frac{5\pi}{3}$

x.  $\frac{7\pi}{6}$

(e) Give the exact values for each of the following.

i.  $\cos(0) =$

iv.  $\cos\left(\frac{\pi}{2}\right) =$

vii.  $\cos\left(\frac{\pi}{3}\right) =$

ii.  $\cos(\pi) =$

v.  $\cos\left(\frac{-\pi}{2}\right) =$

viii.  $\cos\left(\frac{2\pi}{3}\right) =$

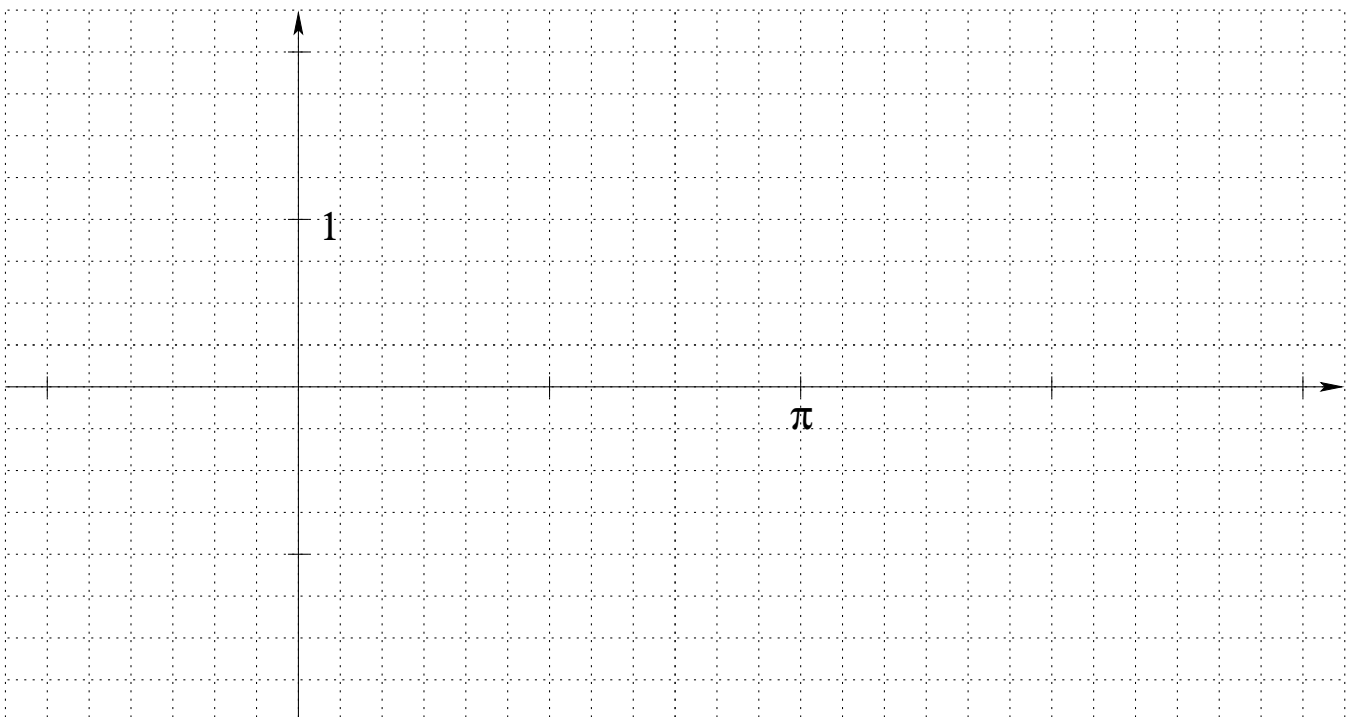
iii.  $\cos(2\pi) =$

vi.  $\cos\left(\frac{3\pi}{2}\right) =$

ix.  $\cos\left(\frac{4\pi}{3}\right) =$

(f) Sketch the graph  $y = \cos x$ . *Fill out the whole coordinate grid.*

(g) Plot and label (with their ordered pairs) the points corresponding to question 2 above.



8. (20 pts) Consider the function  $f(x) = \tan x$ .

(a)  $\text{dom}(\tan) =$

(b)  $\text{range}(\tan) =$

(c) Is tangent an odd function, an even function, or neither?

(d) Give the exact values for each of the following, or state "dne" (for "does not exist").

i.  $\tan(0) =$

iv.  $\tan\left(\frac{\pi}{2}\right) =$

vi.  $\tan\left(\frac{\pi}{4}\right) =$

ii.  $\tan(\pi) =$

vii.  $\tan\left(-\frac{\pi}{4}\right) =$

iii.  $\tan(-\pi) =$

v.  $\tan\left(\frac{-\pi}{2}\right) =$

viii.  $\tan\left(\frac{3\pi}{4}\right) =$

(e) Sketch the graph  $y = \tan x$ . *Fill out the whole coordinate grid.*

(f) Plot and label (with their ordered pairs) the points corresponding to question 2 above as well as all asymptotes (with their equations) appearing in the given grid.

