

Math 1149  
Spring 2013  
  
Midterm 1  
Form A

Name: \_\_\_\_\_  
OSU user name (name.nn): \_\_\_\_\_  
Instructor: \_\_\_\_\_  
Class Time: \_\_\_\_\_

The point value of each problem is indicated. To obtain full credit you must have the correct answers along with **the supporting work**. Answers without supporting work will receive no credit, except for multiple choice problems. **CIRCLE YOUR ANSWERS.**

1. (20 points) **Circle your answer, or fill in the blank.**

(a) Find the degree measure of the angle with the radian measure  $\frac{19\pi}{12}$ .

- i) 570                      ii) 285                      iii) 0.087                      iv) not listed

(b) Find the radian measure of the angle with the degree measure  $-130^\circ$ .

- i)  $-2.269$                       ii)  $-7448$                       iii)  $-1.134$                       iv) not listed

(c) The measures of two angles in standard position are:  $\frac{5\pi}{7}$  and  $\frac{40\pi}{7}$ . Are these two angles coterminal?

- i) Yes    ii) No

(d) The measure of an angle in standard position is  $-500^\circ$ . A positive angle which is coterminal with the given angle is:

- i)  $-140^\circ$                       ii)  $40^\circ$                       iii)  $580^\circ$                       iv) not listed

(e) Find an angle between  $0^\circ$  and  $360^\circ$  that is coterminal with  $1560^\circ$ .

\_\_\_\_\_

2. (a) (12 points) **Sketch** a triangle that has an acute angle  $\theta$ , and **find** the other trigonometric ratios of  $\theta$ , if  $\sin(\theta) = \frac{5}{7}$ .

$$\csc(\theta) = \underline{\hspace{2cm}}$$

$$\cos(\theta) = \underline{\hspace{2cm}}$$

$$\sec(\theta) = \underline{\hspace{2cm}}$$

$$\tan(\theta) = \underline{\hspace{2cm}}$$

$$\cot(\theta) = \underline{\hspace{2cm}}$$

- (b) (8 points) How tall is a building if the angle of elevation from the ground is  $25^\circ$  at a distance of 80m from the base of the building.

3. (20 points) **Circle your answer.**

(a) Find the reference angle for  $280^\circ$ .

i)  $280^\circ$

ii)  $80^\circ$

iii)  $10^\circ$

iv) not listed

(b) Find the quadrant in which an angle  $\theta$  lies, if  $\sin(\theta) < 0$  and  $\cos(\theta) > 0$ .

i) I

ii) II

iii) III

iv) IV

(c) Find the value of  $\sin(\theta)$  if  $\cos(\theta) = \frac{-4}{5}$  and  $\theta$  is in quadrant II.

i)  $\frac{1}{5}$

ii)  $\frac{-3}{5}$

iii)  $\frac{3}{5}$

iv) not listed

(d) Find the area of an equilateral triangle with sides of length 5 in.

i) 21.6

ii) 6.25

iii) 10.8

iv) not listed

(e) Write  $\tan(\theta)$  in terms of  $\sin(\theta)$ , where  $\theta$  is an angle in quadrant II.

i)  $\frac{-\sin(\theta)}{\sqrt{1 - \sin^2(\theta)}}$

ii)  $\frac{\sin(\theta)}{\sqrt{1 - \sin^2(\theta)}}$

iii)  $\frac{-\sqrt{1 - \sin^2(\theta)}}{\sin(\theta)}$

iv) not listed

4. (20 points) **Circle your answer.**

(a) Find the terminal point  $P(x, y)$  on the unit circle determined by  $t = \frac{5\pi}{3}$ .

- i)  $(0.5, -0.87)$       ii)  $(-0.87, 0.5)$       iii)  $(0.99, 0.09)$       iv) not listed

(b) The terminal point on the unit circle determined by  $t$  is the point  $P = \left(\frac{2}{3}, \frac{\sqrt{5}}{3}\right)$ .  
Find the terminal point determined by  $t - \pi$ .

- i)  $\left(\frac{-2}{3}, \frac{\sqrt{5}}{3}\right)$       ii)  $\left(\frac{-2}{3}, \frac{-\sqrt{5}}{3}\right)$       iii)  $\left(\frac{2}{3}, \frac{-\sqrt{5}}{3}\right)$       iv) not listed

(c) Find the sign of  $\csc(t)$  if  $\cos(t) > 0$  and  $\cot(t) < 0$ .

- i) Positive      ii) Negative

(d) Find  $\tan(t)$  if  $\sin(t) = \frac{-3}{4}$  and  $\sec(t) < 0$ .

- i)  $\frac{3}{\sqrt{7}}$       ii)  $\frac{-3}{\sqrt{7}}$       iii) 3      iv) not listed

(e) Determine whether the function  $f(x) = 3x^2 + \cos(x)$  is even, odd, or neither.

- i) Even      ii) Odd      iii) Neither

5. (a) (8 points) A sector of a circle has an angle of  $50^\circ$ . Find the area of the sector if the radius of the circle is 6 ft. Round your answer to two decimal places.

(b) (12 points) Given  $y = 3\sin\left(\frac{\pi}{4}x + \frac{\pi}{2}\right)$ , fill in the blank:

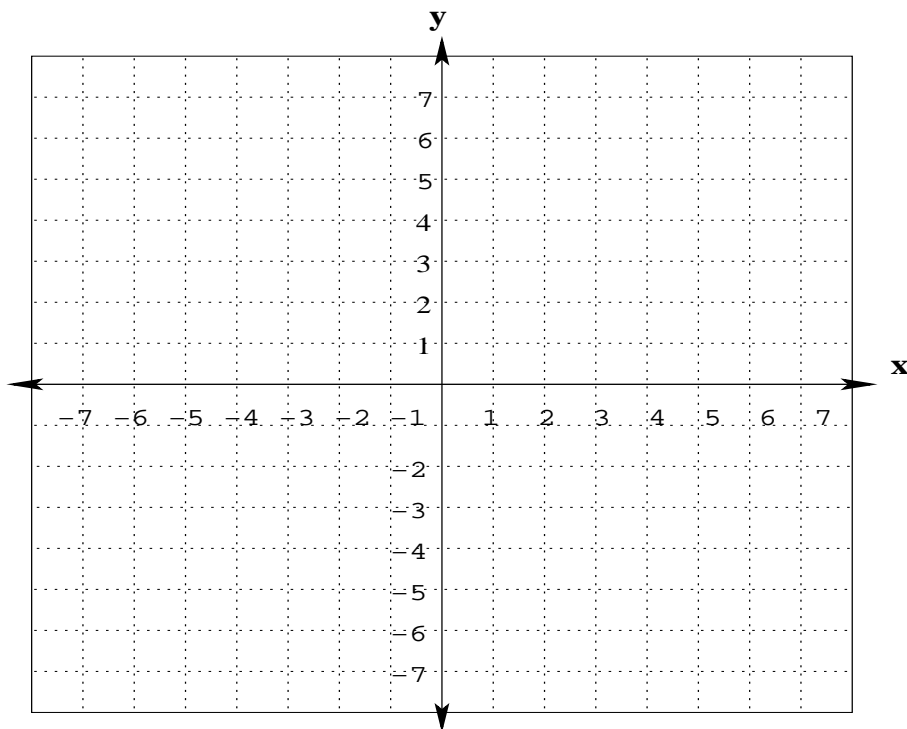
Amplitude: \_\_\_\_\_

Period: \_\_\_\_\_

Phase shift: \_\_\_\_\_

An appropriate interval on which to graph one complete period: \_\_\_\_\_

Graph one complete period, **clearly indicating the  $x$ -intercepts**.



## Formula Sheet

- Area of a triangle with sides of length  $a, b$ , and included angle  $\theta$ :

$$A = \frac{1}{2}ab \sin(\theta)$$

- Trigonometric identities:

$$\sin^2(\theta) + \cos^2(\theta) = 1$$

$$1 + \tan^2(\theta) = \sec^2(\theta)$$

$$1 + \cot^2(\theta) = \csc^2(\theta)$$