

_____/100 points

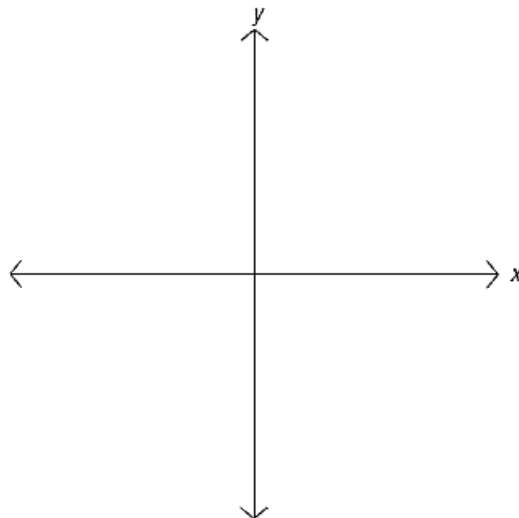
Part 1: This portion of the exam will be done with **no calculator**. Once you have completed this page, turn it in then take out your calculator for Part 2.

1. (4 pts)

(a) Label the angles on the given xy-coordinate system:

$$0, \frac{\pi}{2}, \pi, \frac{3\pi}{2}, 2\pi$$

(b) Fill in the corresponding degree measures for these angles (no work necessary!)



2. (5 pts) Evaluate each of the following (no work necessary but you may want to sketch a unit circle on the graph above!):

$$\cos(\pi) = \underline{\hspace{1cm}} \quad \cos(0) = \underline{\hspace{1cm}} \quad \sin\left(\frac{\pi}{2}\right) = \underline{\hspace{1cm}} \quad \cos\left(\frac{\pi}{2}\right) = \underline{\hspace{1cm}} \quad \sin(2\pi) = \underline{\hspace{1cm}}$$

3. (3 pts) Evaluate: $\sin\left(\frac{\pi}{2}\right)\cos(3\pi)$.

4. (9 pts) Sketch the appropriate triangle for each angle, then evaluate the trig function.

(a) $\tan\left(\frac{\pi}{4}\right)$

(b) $\cos\left(\frac{\pi}{6}\right)$

(c) $\sec\left(\frac{\pi}{3}\right)$

When you've finished, turn in this part of the test and pick up Part 2.

Test 1, Part 2: Calculator Portion

Name: _____

Formulas: $s = r\theta$ $A = \frac{1}{2}r^2\theta$ $\omega = \frac{\theta}{t}$ $v = r\omega$

Part 2: Calculator allowed. *For full credit, show correct, organized work to support your answers.*

1. (3 pts) Convert the angle $\frac{2\pi}{9}$ to degrees (no sketch needed!):

Express your answer to the nearest tenth of a degree.

2. (3 pts) Convert the angle 215° to radians (no sketch needed!):

Express your answer as a reduced fraction.

3. (5 pts) Sketch the angle 680° in standard position and find a positive and a negative coterminal angle.

Sketch:

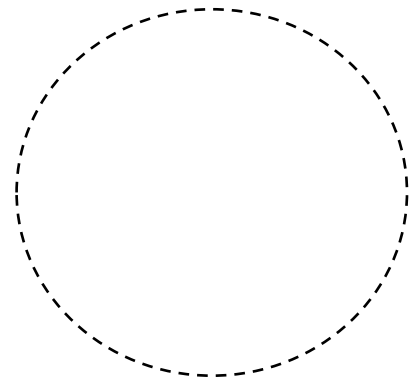
Positive coterminal angle: _____

Negative coterminal angle: _____

4. (5 pts) (a) Find the length of a circular arc, if the circle has a radius 4 centimeters subtended by the central angle of 120° .

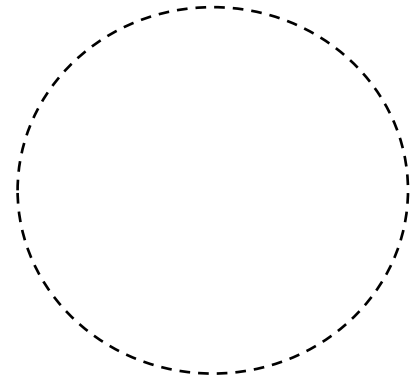
Approximate the answer to 1 decimal place and include units!

Arclength \approx _____



- (b) On the given circle, sketch and label the radius, angle, and arc. Label the arc with the arclength you found.

5. (5 pts) (a) Find the area of the sector with radius of 8 feet and an angle of $\frac{\pi}{3}$ radians
Approximate the answer to 1 decimal place and include units!



Sector Area \approx _____

- (b) On the given circle, sketch and label the radius, angle, and shade in the sector..

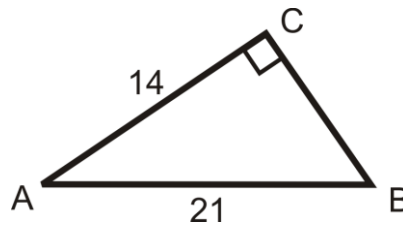
6. (10 points) Find the missing side of the triangle then find the exact values of the trig functions for angle A or angle B, as specified. Simplify the square root and reduce fractions. You do not need to rationalize denominators!

$\cos(A) =$

$\tan(A) =$

$\sin(B) =$

$\csc(B) =$



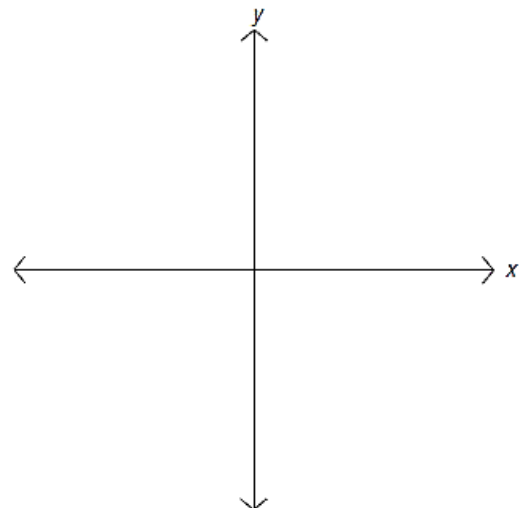
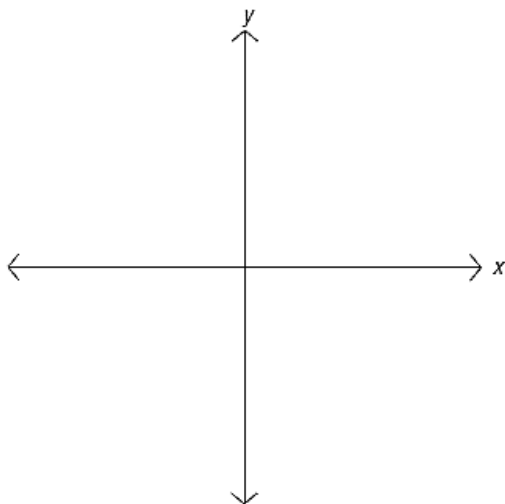
7. (6 pts) Sketch the angle then find and **label** the reference angle on the sketch.

(a) 123°

Reference angle: _____

(b) $\frac{7\pi}{6}$

Reference angle: _____



8. (3 pts) If $\cos(t) < 0$, which quadrants could t be in? _____
9. (8 pts) Find the exact value of each of the following, using reference angles. For full credit, you have to show a sketch.

(a) $\sin\left(\frac{4\pi}{3}\right)$.

(b) $\tan\left(\frac{5\pi}{4}\right)$.

10. (8 pts) Evaluate the following using your calculator. Round to 3 decimal places.

$\sin\left(\frac{3\pi}{5}\right) =$ _____ $\csc(284^\circ) =$ _____

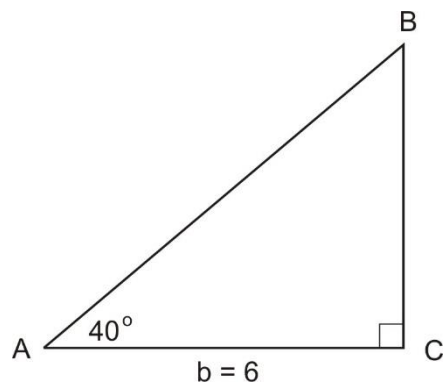
$\sec(-5^\circ) =$ _____ $\cot\left(\frac{\pi}{13}\right) =$ _____

11. (6 pts) Find the missing sides and angle of the triangle below. Approximate your answers to two decimal places.

a = _____

c = _____

B = _____



12. (5 pts) You are building a ramp for wheelchair access into a building. If the ramp must have a height of 8 feet, and the angle of the ramp must be 5° , how long (diagonal) must the ramp be?

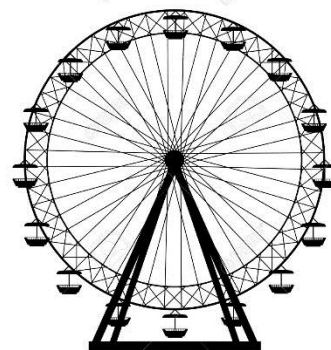


13. (5 pts) Kiley is on the top of a vertical cliff that is 40 meters high. She sees Carlos below and estimates the angle of depression is 35° . How far is Carlos from the base of the cliff? Don't worry about the heights of the people!



14. (6 pts) The Mid-State Fair has a Ferris wheel with a diameter of 100 feet. The time for the Ferris wheel to make one revolution is 1 minute.

(a) What is the angular speed of the Ferris wheel in radians per second? Approximate the answer to two decimal places.



(b) What is the linear speed in feet per second of a point on the Ferris wheel? Approximate the answer to two decimal places.

Extra credit (3 pts): In problem #13, if Kiley is 1.7 meters tall, estimate how much this would CHANGE the distance from Carlos to the cliff. (Do the work for this on the back side of the paper.)