

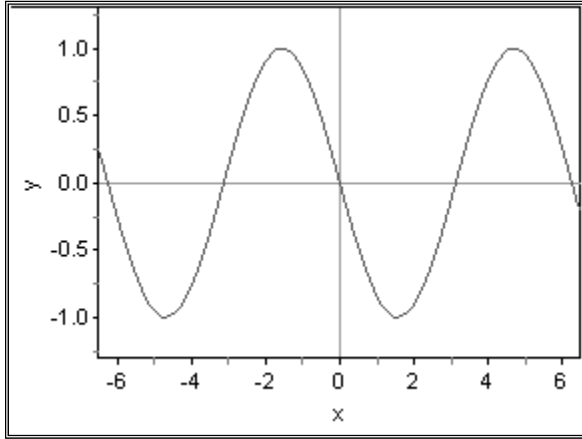
# Trigonometry Test

Name \_\_\_\_\_

No Calculators. All angular measures are in radians.

## Question 1. (6 points)

Find 3 different trigonometric functions,  $a(x)$ ,  $b(x)$ , and  $c(x)$ , that each describe this graph. Write your answers in the spaces provided.



$a(x) =$  \_\_\_\_\_ (2 points)

$b(x) =$  \_\_\_\_\_ (2 points)

$c(x) =$  \_\_\_\_\_ (2 points)

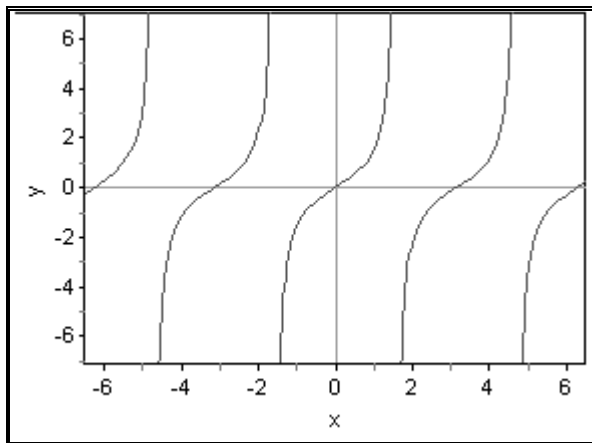
## Question 2 (12 points)

Albert and Bob are on a Ferris wheel of radius 100 feet. The center of the wheel is 110 feet off the ground. The wheel takes exactly 30 minutes to make one counter-clockwise rotation. At time=0, Albert is at the bottom of the Ferris wheel, and Bob is at the 3 o'clock position.

- Write a trigonometric expression for Albert's height above the ground. (5 points)
- Sketch a graph of Bob's height above the ground. Be sure to label the axes. (5 points)
- How many times during the first 30 minutes of their ride will Albert and Bob be the same height above the ground? (2 points)

**Question 3. (9 points)**

Below is a graph of  $f(x) = \tan x = \frac{\sin x}{\cos x}$ . Answer the following questions:



a. List all of the exact x-values (not just those shown) where the function is zero. (2 points)

b. List all of the exact x-values (not just those shown) where the function is undefined. (2 pts)

c. Consider  $g(x) = \cot x = \frac{\cos x}{\sin x}$ . Are the functions *tangent* and *cotangent* equal to zero at the same x-values? Explain why or why not in 2-3 complete sentences. (5 points)