

# Investigating Trigonometric Functions

Name \_\_\_\_\_

The Reciprocal Functions [TrigFunc.gsp]



**I.** Click on the section titled “**Cosecant Function**” (or click the tab at the bottom of the screen).  
Answer the following questions:

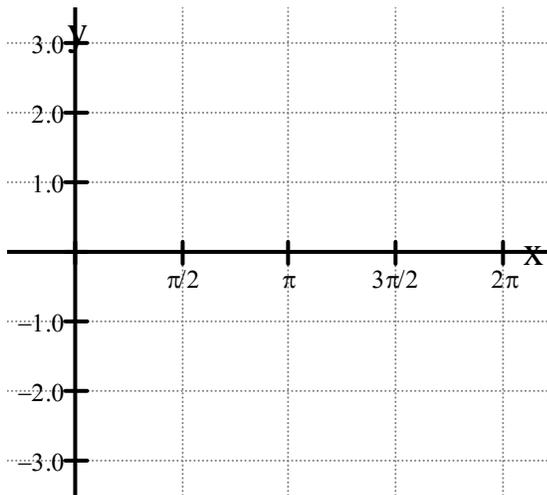
1. What is the range of  $f(x) = \csc(x)$  ? \_\_\_\_\_

2. Fill in the box with the appropriate trig. function:  $\text{CSC}(x) = \frac{1}{\boxed{\phantom{000}}}$

3. Click on “*Show sin(x)*”.

4. On the  $x$ -interval 0 to 3, at what point are the functions  $f(x) = \sin(x)$  and  $g(x) = \csc(x)$  tangent to one another? \_\_\_\_\_

5. On the  $x$ -interval -5 to 5, how many times is  $f(x) = \csc(x)$  asymptotic? \_\_\_\_\_  
Approximate the decimal locations of the asymptotes \_\_\_\_\_



6. Using the grid at the left, graph  $g(x) = \csc(x)$  and  $f(x) = \sin(x)$ . Label the functions.

Be careful that your  $x$ -values in full decimal form from Sketchpad and the  $x$ -values in radian notation on the graph grid represent the same values.



**II.** Click on the section titled “**Secant Function**” (or click the tab at the bottom of the screen).  
Answer the following questions:

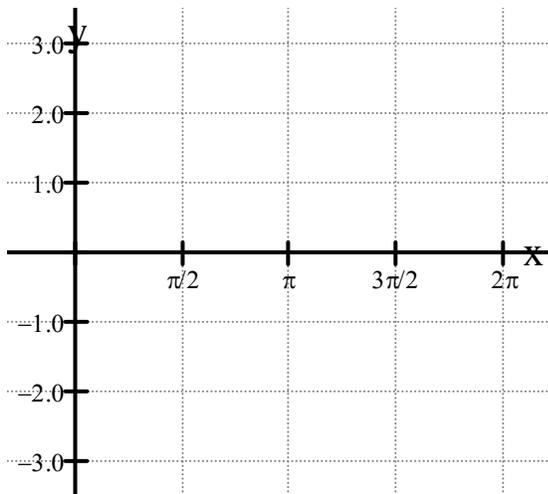
1. What is the range of  $f(x) = \sec(x)$  ? \_\_\_\_\_

2. Fill in the box with the appropriate trig. function:  $\text{SEC}(x) = \frac{1}{\boxed{\phantom{000}}}$

3. Click on “*Show cos(x)*”.

4. On the  $x$ -interval -1 to 4, at what points are the functions  $f(x) = \cos(x)$  and  $g(x) = \sec(x)$  tangent to one another? \_\_\_\_\_

5. On the  $x$ -interval -6 to 3, how many times is  $f(x) = \sec(x)$  asymptotic? \_\_\_\_\_  
Approximate the decimal locations of the asymptotes \_\_\_\_\_



6. Using the grid at the left, graph  $g(x) = \sec(x)$  and  $f(x) = \cos(x)$ . Label the functions.

Be careful that your  $x$ -values in full decimal form from Sketchpad and the  $x$ -values in radian notation on the graph grid represent the same values.

 **III.** Click on the section titled “**Cotangent Function**” (or click the tab at the bottom of the screen.

Answer the following questions:

1. On the closed  $x$ -interval from 0 to 3, how many times is  $f(x) = \cot(x)$  asymptotic ?

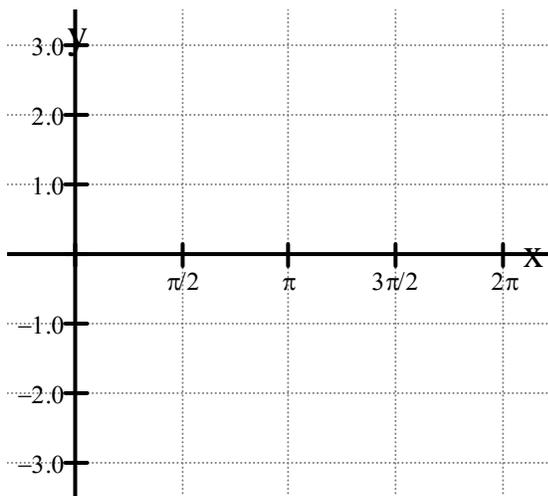
Approximate the decimal locations of the asymptotes \_\_\_\_\_

2. Fill in the box with the appropriate trig. function:  $\cot(x) = \frac{1}{\boxed{\phantom{000}}}$

3. Click on “*Show tan(x)*”.

4. On the  $x$ -interval 0 to 2, at what approximate decimal location is the function  $f(x) = \tan(x)$  equal to the function  $g(x) = \cot(x)$  ? \_\_\_\_\_

Approximately, what would this value be in radian notation? \_\_\_\_\_



5. Using the grid at the left, graph  $g(x) = \cot(x)$  and  $f(x) = \tan(x)$ . Label the functions.

Be careful that your  $x$ -values in full decimal form from Sketchpad and the  $x$ -values in radian notation on the graph grid represent the same values.