Accel Precalc   <u>Handout: Graphing Secant and Cosecant</u>   Name:________________

Unit #6: Graphs and Inverses of Trig Functions

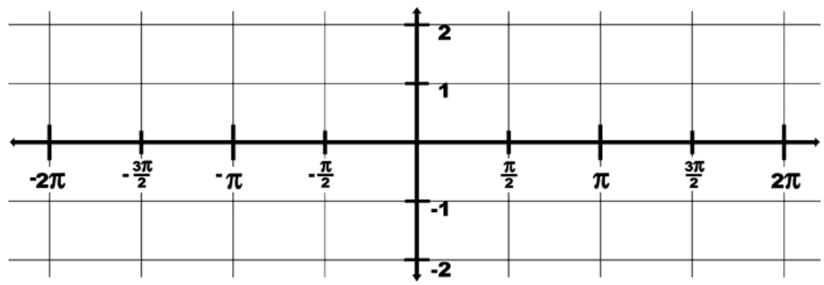
Lesson 5: Graphs of Secant and Cosecant

Complete the following tables. Remember you may convert sec(x) and csc(x) into decimal values if needed. Plot each point on the given coordinate plane. Connect continuous points to make a smooth curve. Mark any vertical asymptotes with a dotted vertical line. Do not connect any points across these asymptotes.

Graphing f(x)=sec(x)

[Hint: Since sec is the reciprocal of cos, graph cos first.]

x	y=sec(x)	(x,y)
-2π	1	
-7π/4	√2	(-7π/4 , 1.4)
-3π/2	Undefined	Vertical asymptote
-5π/4		
-π		
-3π/4		
-π/2		
-π/4		
0		
π/4		
π/2		
3π/4		
π		
5π/4		
3π/2		
7π/4		
2π		



Facts to know about the graph of sec(x):

1. The domain is ____________. Therefore you will have ________ ____________. List at least 4 asymptotes__________. They will occur every ___.

2. The range is __________________.

3. Secant is symmetric to the _____________. Therefore secant is an _________ function.

4. The secant function is periodic. It cycles every ______ or ________°.

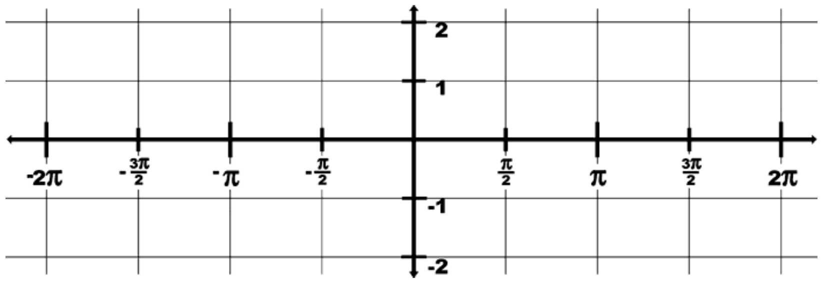
5. Are there any x-intercepts? ________

6. Is there a y-intercept?_________

Graphing f(x) = csc (x)

[Hint: Since csc is the reciprocal of sin, graph sin first.]

x	y = csc(x)	Ordered pair (x,y)
-2π	undefined	Vertical asymptote
$-7\pi/4$	$\sqrt{2}$	$(-7\pi/4\ ,\ 1.4)$
$-3\pi/2$	1	
$-5\pi/4$		
$-\pi$		
$-3\pi/4$		
$-\pi/2$		
$-\pi/4$		
0		
$\pi/4$		
$\pi/2$		
$3\pi/4$		
π		
$5\pi/4$		
$3\pi/2$		
$7\pi/4$		
2π		



Facts to know about the graph of csc(x):

1. The domain is ____________. Therefore you will have ________ ____________. List at least 4 asymptotes__________. They will occur every ___.

2. The range is __________________.

3. Cosecant is symmetric to the _____________. Therefore cosecant is an _________ function.

4. The cosecant function is periodic. It cycles every _______ or ________°.

5. Are there any x-intercepts? ________

6. Is there a y-intercept?_________

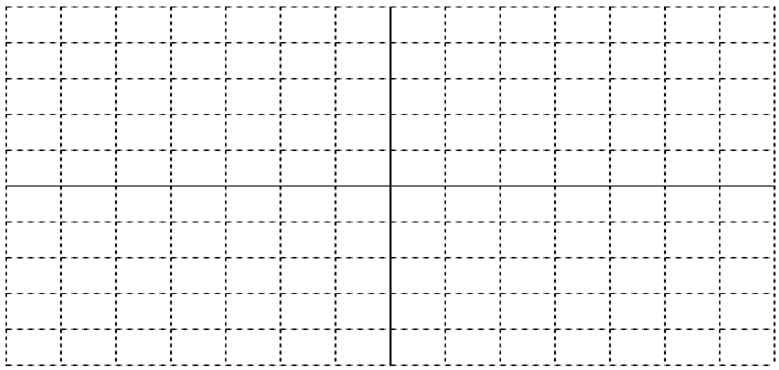
- ❖ Hint: When transforming secant and cosecant functions, you want to use the important points from the graph and transform those ordered pairs. Remember you only have to graph a full period of the function. After that you can use patterns to graph more than one.

Transformations of the Secant and Cosecant Functions

1. $y = \sec(x + \pi/4)$

- How is this graph transformed? ______________________________
- What happens to the x-value? ______________________________
- What about the y-value?______________________________
- Has the period changed? ______________________________
- Have the asymptotes changed?______________________________

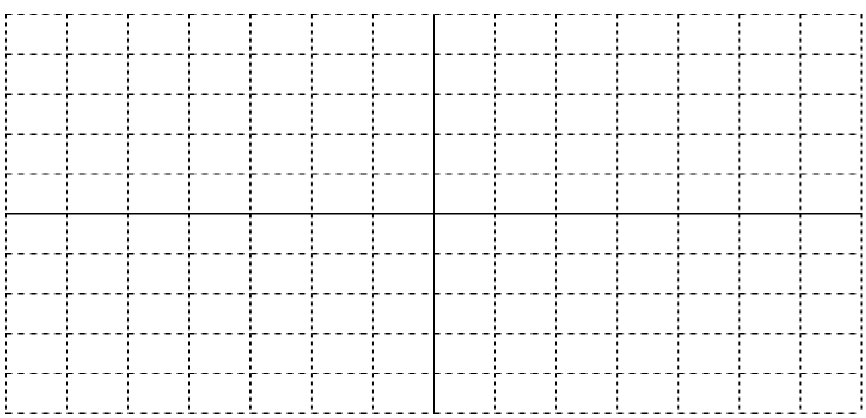
Sketch a graph of the transformed function



2. $y = \sec(2x)$

- How is this graph transformed? ______________________________
- What happens to the x-value? ______________________________
- What about the y-value?______________________________
- Has the period changed? ______________________________
- Have the asymptotes changed?______________________________

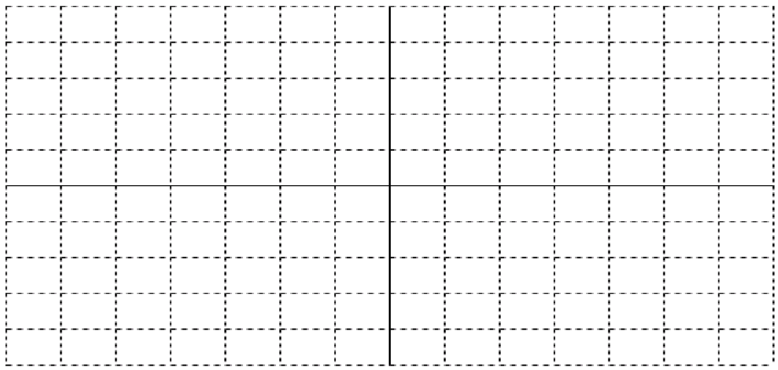
Sketch a graph of the transformed function



3. $y = -\csc(x) + 1$

- How is this graph transformed? ____
- What happens to the x-value? ____
- What about the y-value?____
- Has the period changed? ____
- Have the asymptotes changed?____________________________________

Sketch a graph of the transformed function



4. $y = \frac{1}{2} \csc(x)$

- How is this graph transformed? ____
- What happens to the x-value? ____
- What about the y-value?____
- Has the period changed? ____
- Have the asymptotes changed?____________________________________

Sketch a graph of the transformed function