Name: _____ **Precalculus Unit 9, Lesson 7**

Aim: How do we graph the other trigonometric functions?

I. Do Now:

1. Use your calculator to complete the table. (You may round to the nearest tenth.)
   Note that $\frac{\pi}{2} \approx 1.5708$ and $\frac{\pi}{4} \approx 0.7854$.

x	$-\frac{\pi}{2}$	-1.57	-1.5	-1	$-\frac{\pi}{4}$	0	$\frac{\pi}{4}$	1	1.5	1.57	$\frac{\pi}{2}$
$\tan x$											

Properties of $y = \tan x$:

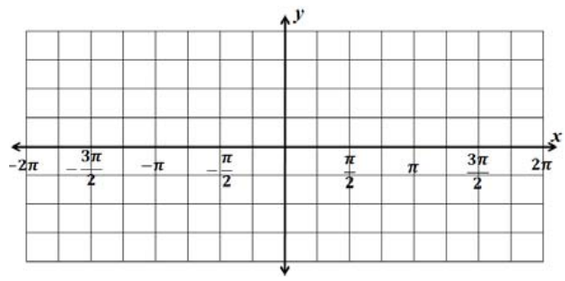
Domain:

Range:

Period:

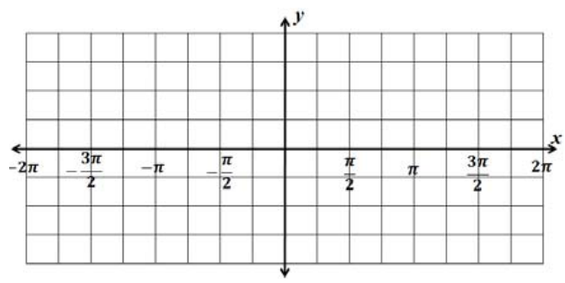
Amplitude:

Vertical Asymptotes:



II. Graph of $y = \cot x$:

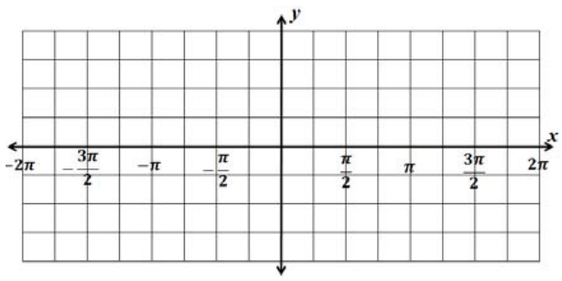
- The graph of is similar to the graph of the tangent function. It also has a period of _____.
- However, since $y = \cot x = \frac{\cos x}{\sin x}$, the cotangent function has vertical asymptotes at _____ because _____.



III. Graphs of $y = \sec x$ and $y = \csc x$:

To sketch the remaining two trig functions use the reciprocal identities: $y = \sec x = \frac{1}{\cos x}$ $y = \csc x = \frac{1}{\sin x}$
Start by graphing $y = \sin x$ and $y = \cos x$. Then, take the reciprocals of the y-coordinates to obtain points on the graphs of their reciprocals.

$y = \csc x$



Properties of $y = \csc x$:

Domain:

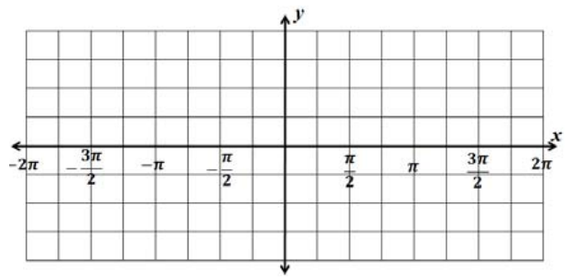
Range:

Period:

Amplitude:

Vertical Asymptotes:

$y = \sec x$



Properties of $y = \sec x$:

Domain:

Range:

Period:

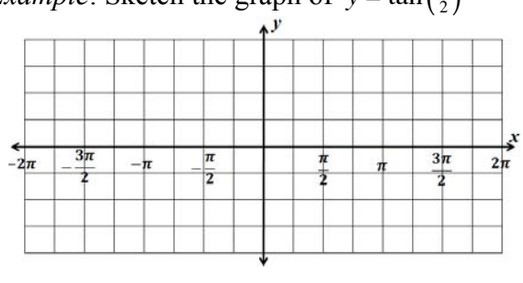
Amplitude:

Vertical Asymptotes:

IV. Transformations of Other Trigonometric Functions

Just as we can transform the basic sine and cosine graphs, we can transform the graphs of $y = \tan x$, $y = \cot x$, $y = \csc x$, and $y = \sec x$. (Note that for tangent and cotangent, since the period is π, the period for $y = \tan(bx)$ or $y = \cot(bx)$ is _____.)

Example: Sketch the graph of $y = \tan\left(\frac{x}{2}\right)$



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- p. 311: 1 – 3, 5 – 8
- p. 341: 87, 91