

Graphing Trig Functions-- Day 1

What you should learn: To graph the sine, cosine, and tangent functions by hand.

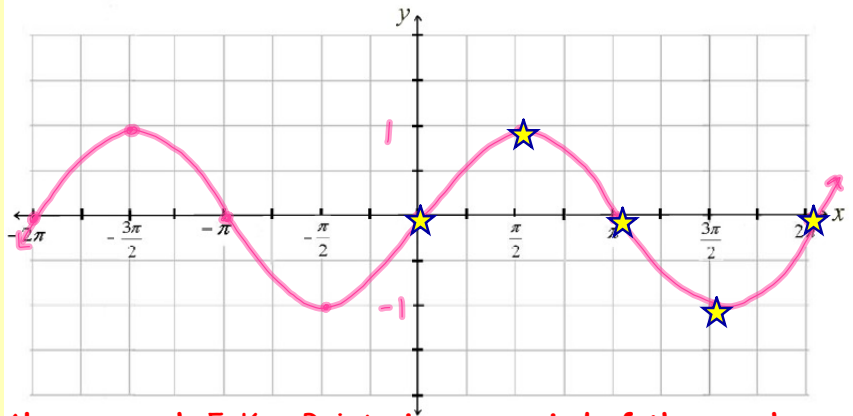
Why you should learn it: Graphs of trig functions can be used to model real-world situations.

Today we are going to be graphing the basic sine, cosine and tangent curves. We briefly looked at these graphs in chapter 4 and now we want to look at them a lot closer.

In chapter 4 we talked about the domain, range and period of the sine and cosine functions. What are they?

Domain: $(-\infty, \infty)$ Range: $[-1, 1]$ Period: 2π

Graph of $\sin x$ --(Values from Unit Circle Chart)



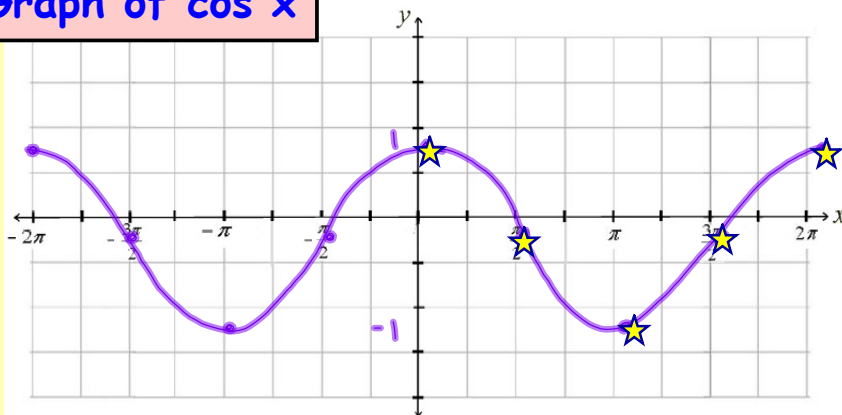
Always graph 5-Key Points in one period of the graph

- ★ Intercepts
- ★ Maximums
- ★ Minimums

What kind of symmetry does $\sin x$ have? *origin - flip over x-axis then y-axis*

What do we call a function with origin symmetry? *odd*

Graph of $\cos x$



What kind of symmetry does $\cos x$ have?

y-axis

What do we call a function with y -axis symmetry?

even

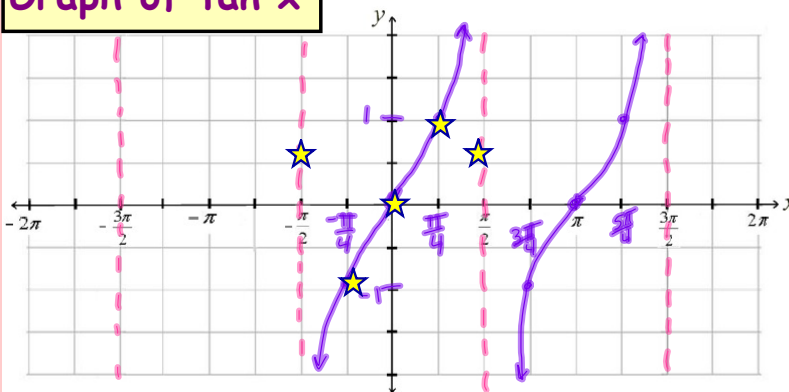
The Tangent Function

We know by looking at our unit circle chart that there are values for which tangent is undefined. What are these values? $\frac{\pi}{2}, \frac{3\pi}{2}$

Because of these values our domain is not going to be all reals like it is for the sine and cosine functions.

Let's look at graphing the tangent function.

Graph of $\tan x$



Domain: all $x \neq \frac{\pi}{2} \pm n\pi$ Range: all reals Period: π

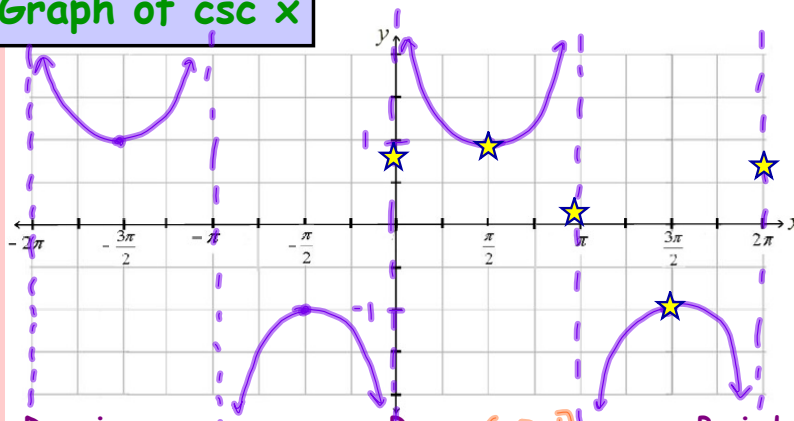
Vertical Asymptotes: $\frac{\pi}{2} \pm n\pi$ *n is a natural number* Symmetry: origin odd function

Always graph 5-Key Parts in one period of the graph.

- ★ 2-asymptotes
- ★ intercept
- ★ 2-other points on graph

Now let's look at the reciprocal trig functions and their graphs.

Graph of $\csc x$



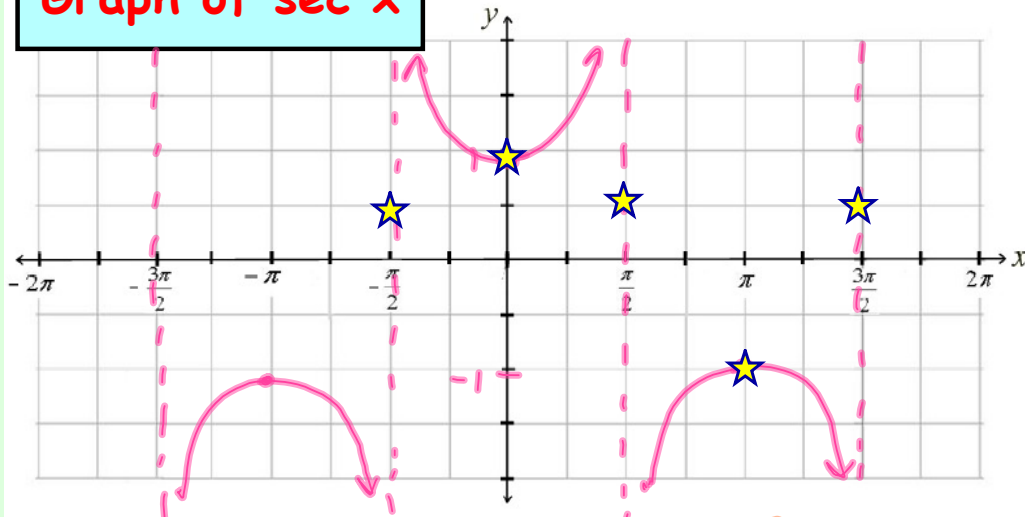
Domain: all $x \neq \pm n\pi$ *n is a natural number* Range: $(-\infty, -1] \cup [1, \infty)$ Period: 2π

Vertical Asymptotes: $\pm n\pi$ Symmetry: origin odd function

Always graph 5-Key Parts in one period of the graph.

- ★ 3-asymptotes
- ★ 2-main curves on graph

Graph of sec x



Domain:

all $x \neq \frac{\pi}{2} \pm n\pi$ n is a natural number

Range: $(-\infty, -1] \cup [1, \infty)$

Period: 2π

Vertical Asymptotes:

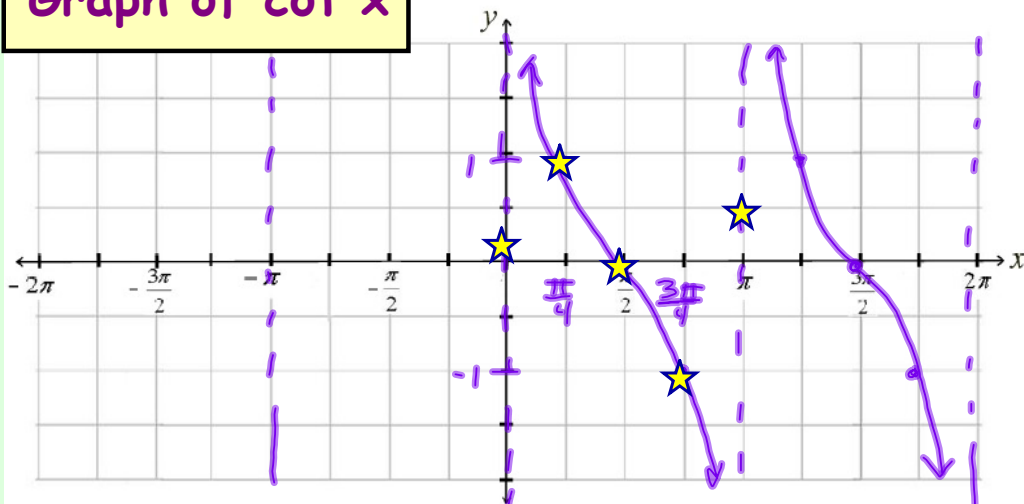
$\frac{\pi}{2} \pm n\pi$

Symmetry: y-axis
even function

Always graph 5-Key Parts in one period of the graph.

- ★ 3-asymptotes
- ★ 2-main curves on graph

Graph of cot x



Domain:

all $x \neq n\pi$ n is a natural number

Range: all reals

Period: π

Vertical Asymptotes:

$\pm n\pi$

Symmetry: origin
odd function

Always graph 5-Key Parts in one period of the graph.

- ★ 2-asymptotes
- ★ intercept
- ★ 2-other points on graph