

Learning Target(s): I am able to graph the sine, cosine, and tangent functions.

I am able to identify the important features (amplitude, period, max, min, x-intercepts, and frequency) of the sine, cosine, and tangent functions.

14.1 Notes- Part 2: Graph Sine, Cosine, and Tangent Functions

Characteristics of $y = a \tan bx$

- The period is: $\frac{\pi}{|b|}$
- Has no max or min.
- It is centered around the x axis and has 2 asymptotes.
- a stretches or shrinks the graph and -a reflects about the x axis

Ex. 1

Graph one period of the function $y = 2 \tan x$

① tan starts at 0

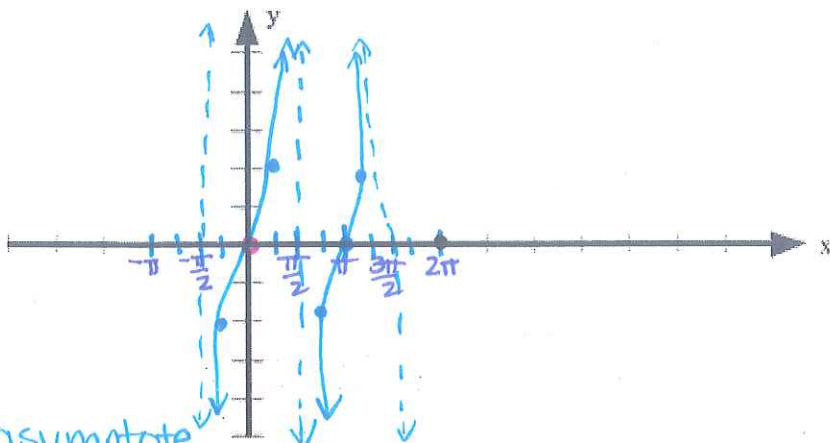
② Period is $\frac{\pi}{|b|}$

$$b=1 \text{ so } \pi$$

③ $a=2$

Count to period, cut in '1/2 \rightarrow asymptote
cut in '1/2s again to get other points

* scale is $\frac{\pi}{2}$ for x-axis



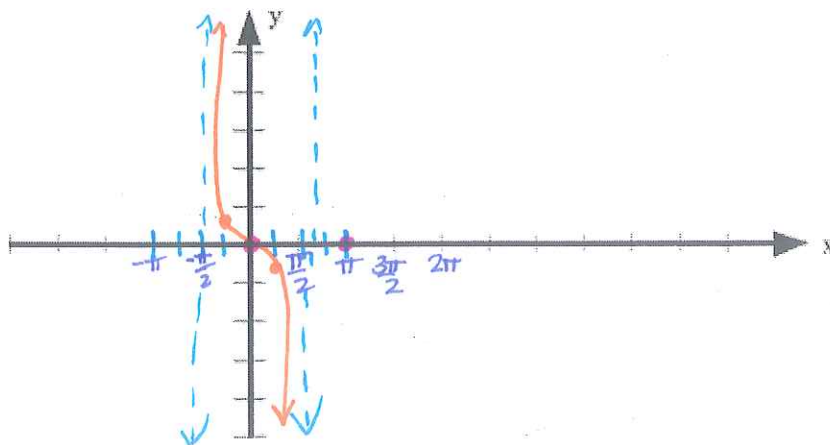
Ex. 2

Graph one period of the function $y = -\frac{1}{2} \tan x$

① tan starts at 0

② period is $\frac{\pi}{|1|} = \pi$

③ $a = +\frac{1}{2}$ & reflected



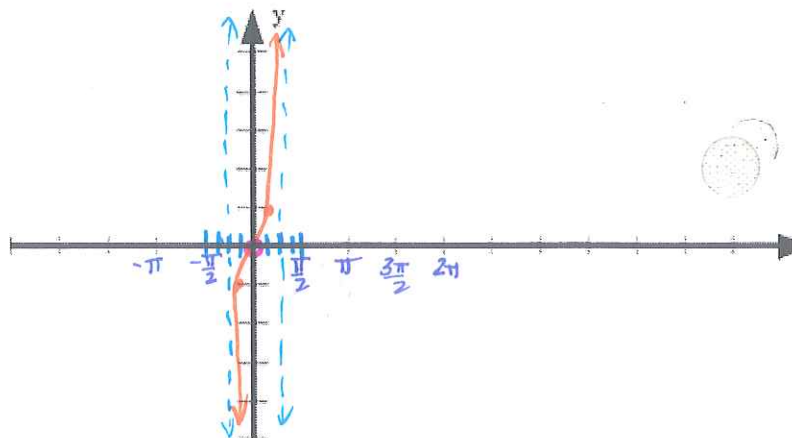
Ex. 3

Graph one period of the function $y = \tan 2x$

① \tan starts at 0

② $b = 2$ so period is $\frac{\pi}{2}$

③ $a = 1$



How does b affect the period?

When $b > 1$, the period condenses

When $b < 1$, the period expands

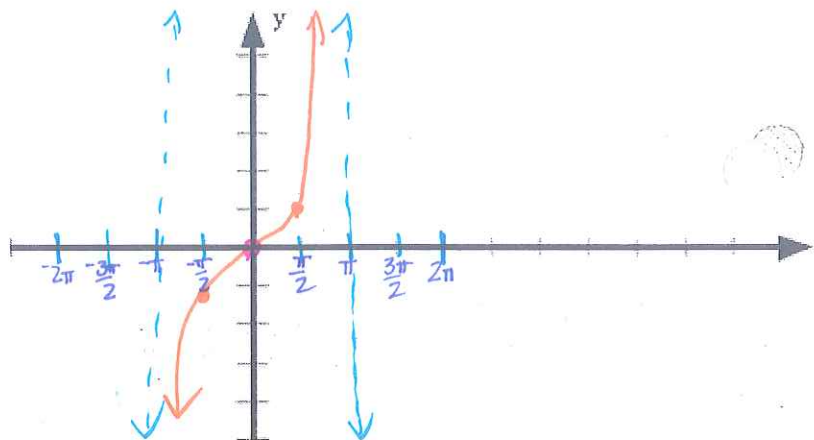
Ex. 4

Graph one period of the function $y = \tan \frac{x}{2}$

① \tan starts at 0

② $b = \frac{1}{2}$ so period is $\frac{\pi}{\frac{1}{2}} = 2\pi$

③ $a = 1$



Ex. 5

Graph one period of the function $y = 2 \tan 4x$

① \tan starts at 0

② $b = 4$ period is $\frac{\pi}{4}$

③ $a = 2$

