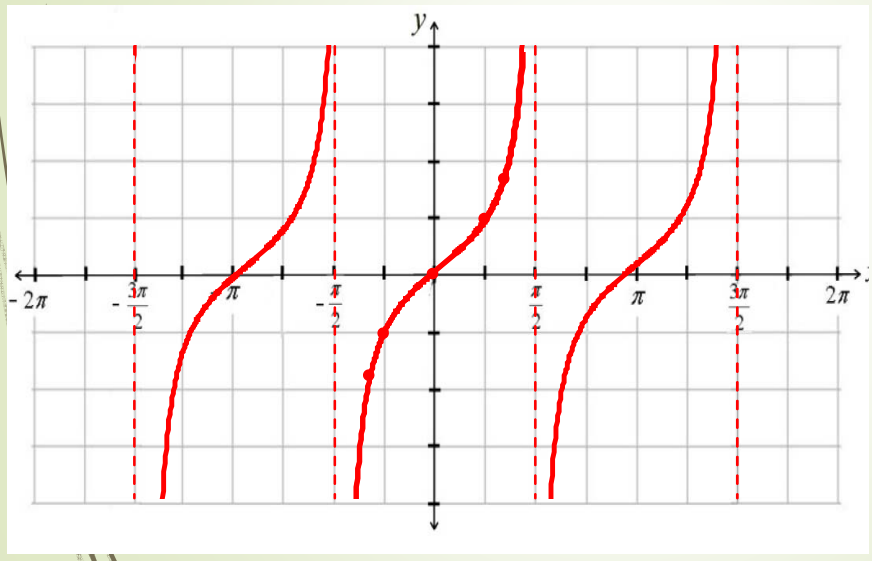
4-5: Graphing Other Trigonometric Functions

CP Precalculus

Mr. Gallo

The Graph of $y = \tan(\theta)$



θ	$\tan(\theta)$
$-\pi/2$	Undefined
$-\pi/3$	-1.73
$-\pi/4$	-1
0	0
$\pi/4$	1
$\pi/3$	1.73
$\pi/2$	Undefined

The Properties of $y = \tan(\theta)$

Domain:

Range:

***x*-intercepts:**

***y*-intercept:**

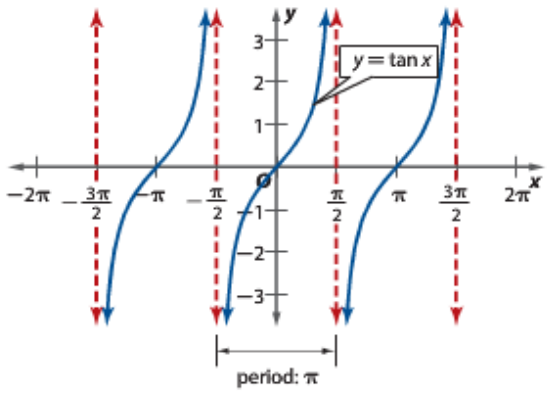
Continuity:

Asymptotes:

Symmetry:

Extrema:

End Behavior:



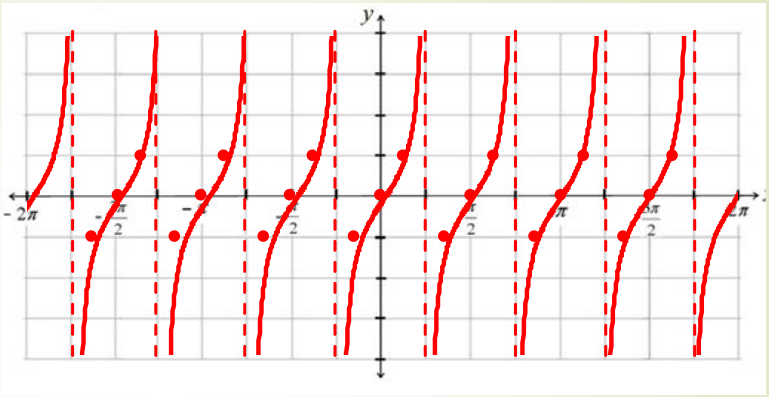
Graphing a Tangent Function

The full tangent function is $y = a \tan b\theta$.

- The Period of a Tangent Function is $\frac{\pi}{b}$
- One cycle occurs between $-\frac{\pi}{2b}$ to $\frac{\pi}{2b}$
- Asymptotes occur at the start and end of each cycle
- The *a* value marks the *y* value of the *x* coordinate which is half way between an asymptote and the zero for each cycle.

Graph $y = \tan(2\theta)$

θ	$\tan(\theta)$
$-\pi/8$	-1
0	0
$\pi/8$	1

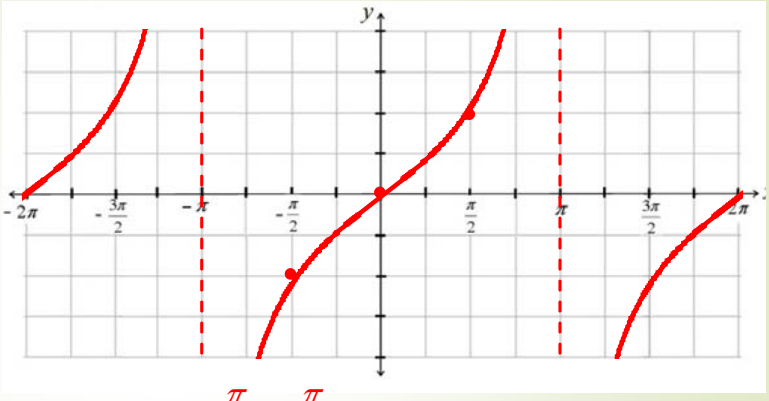


a. Find the period of the function: $\frac{\pi}{b} = \frac{\pi}{2}$

b. Determine where the asymptotes are for one cycle using $-\frac{\pi}{2b}$ and $\frac{\pi}{2b}$ $-\frac{\pi}{2b} = -\frac{\pi}{2(2)} = -\frac{\pi}{4}$ $\frac{\pi}{2b} = \frac{\pi}{2(2)} = \frac{\pi}{4}$

Graph $y = 2\tan(1/2\,\theta)$

θ	$\tan(\theta)$
$-\pi/2$	-2
0	0
$\pi/2$	2



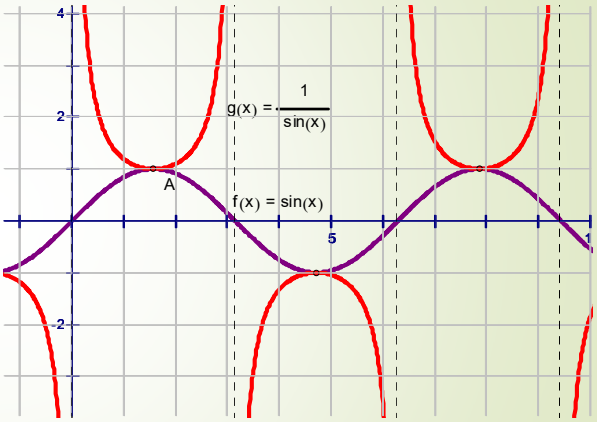
a. Find the period of the function: $\frac{\pi}{b} = \frac{\pi}{1/2} = 2\pi$

b. Determine where the asymptotes are for one cycle using $-\frac{\pi}{2b}$ and $\frac{\pi}{2b}$ $-\frac{\pi}{2b} = -\frac{\pi}{2\left(\frac{1}{2}\right)} = -\pi$ $\frac{\pi}{2b} = \frac{\pi}{2\left(\frac{1}{2}\right)} = \pi$

Homework: WS13-6K #5-13 odd & Graph

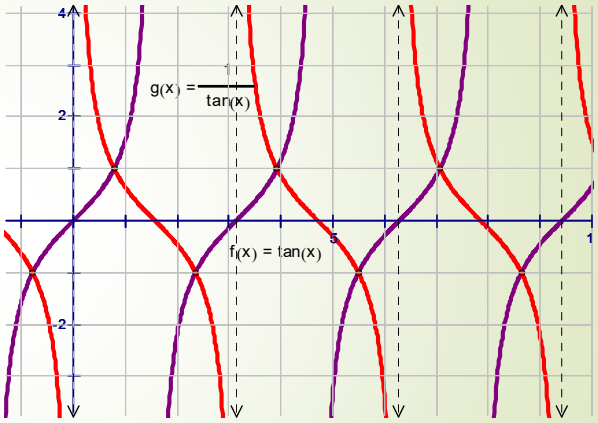
Sketching Graphs of Reciprocal Functions

- Sine and Cosecant
  - Functions intersect at the Min/Max points.
  - Cosecant has asymptotes wherever $\sin x = 0$.
- Cosine and Secant
  - Functions intersect at the Min/Max points.
  - Secant has asymptotes wherever $\cos x = 0$.



Sketching Graphs of Reciprocal Functions

- Tangent and Cotangent
  - Functions intersect at the a points.
  - Cotangent has asymptotes wherever $\tan x = 0$.



Homework: p.277 #1, 4-6, 9-16; Graph #1, 5, 11, 12