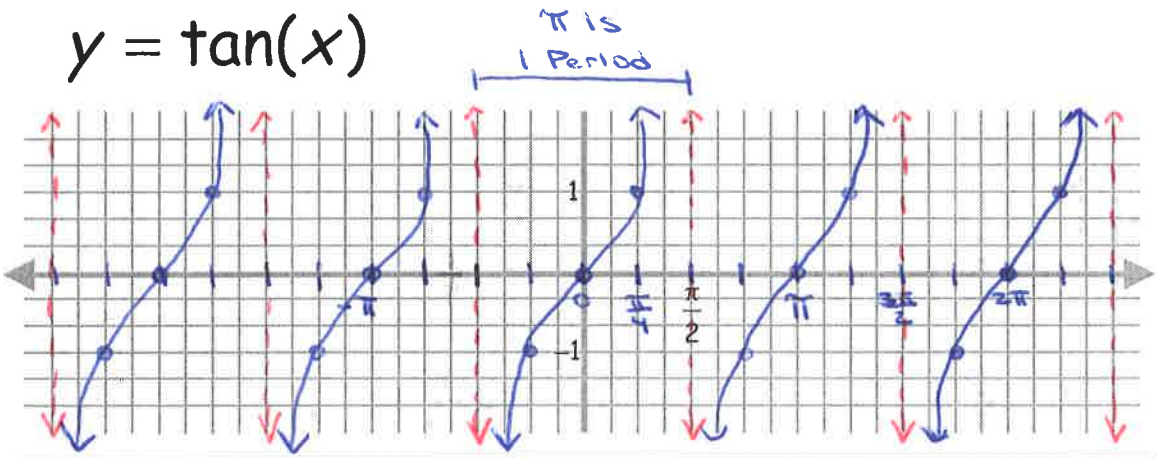
Precalculus Name Key

4.6 Notes: Graphs of Other Trigonometric Functions- *Day 1*

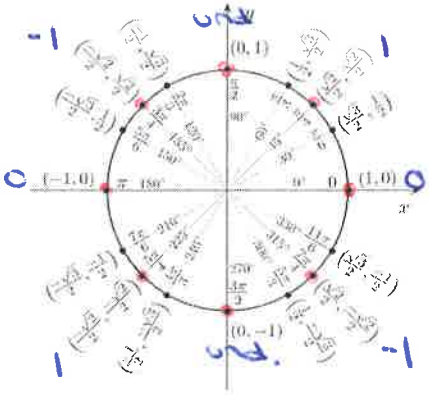
x	y
$-\frac{3\pi}{2}$	und.
$-\frac{5\pi}{4}$	-1
$-\pi$	0
$-\frac{3\pi}{4}$	1
$-\frac{\pi}{2}$	und.
$-\frac{\pi}{4}$	-1
0	0
$\frac{\pi}{4}$	1
$\frac{\pi}{2}$	und.
$\frac{3\pi}{4}$	-1
π	0
$\frac{5\pi}{4}$	1
$\frac{3\pi}{2}$	und.

$y = \tan(x)$



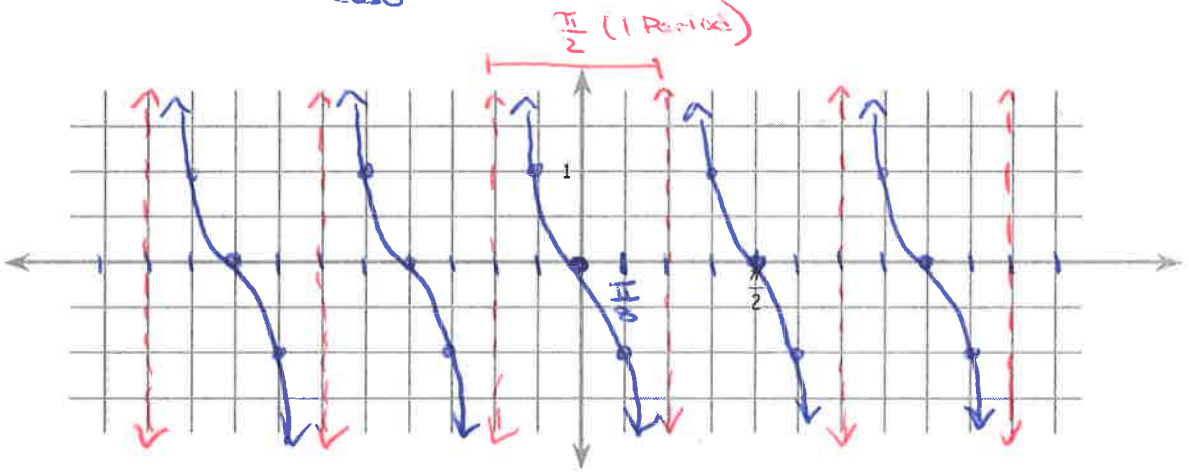
Domain:	Range:	Period:
$\mathbb{R}$ except $x = \frac{\pi}{2} + n\pi$ where n is an integer ($n \in \mathbb{Z}$)	$(-\infty, \infty)$	π

- When determining the domain, consider the fact that there are undefined values that occur at a regular interval. Figure out where the first undefined value is and then how often these undefined values occur.
- Notice that there are still "**important values**," however they occur every $\frac{\pi}{4}$ radians.
- Instead of having relative extrema and intercepts, there are x-intercepts, asymptotes, or points that show the vertical stretch.
- You can still find the important values by dividing the period by 4.
- Note there is not amplitude, because this is not a sinusoidal (wave) graph.



$\tan\theta = \frac{\sin\theta}{\cos\theta}$

1. $y = -\tan(2\theta)$



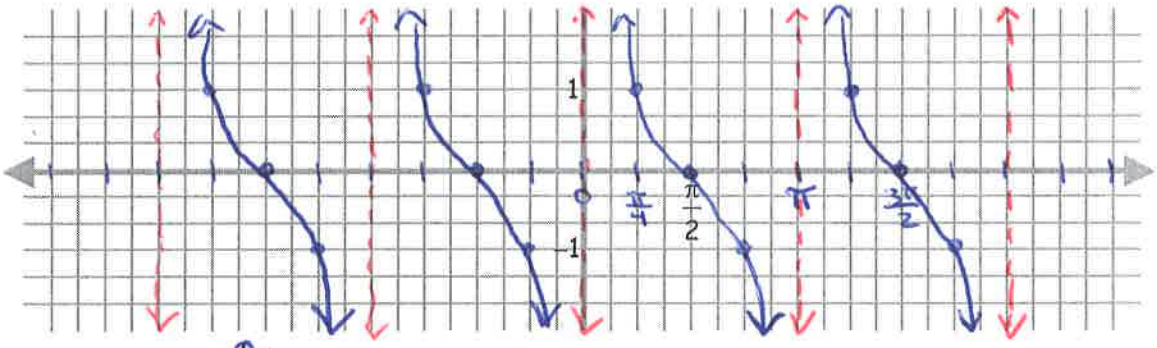
Amplitude: NONE *There is only an amplitude for sinusoidal functions*	Phase Shift: 0	Important Values: $\frac{\pi}{2} \div 4 = \frac{\pi}{2} \cdot \frac{1}{4} = \frac{\pi}{8}$
Period: $\frac{\pi}{b} = \frac{\pi}{2}$	Vertical Shift: 0	Reflection? yes * function will decrease

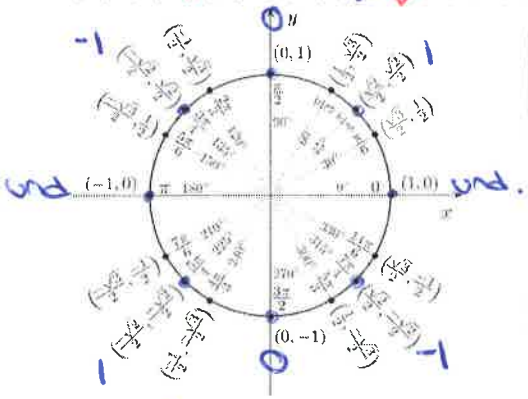
* every intersection occurs every $\frac{\pi}{2}$ Radians

$y = \cot(x)$

$y = \frac{1}{\tan(x)}$

x	y
$-\frac{3\pi}{2}$	0
$-\frac{5\pi}{4}$	-1
$-\pi$	und.
$-\frac{3\pi}{4}$	1
$-\frac{\pi}{2}$	0
$-\frac{\pi}{4}$	-1
0	und.
$\frac{\pi}{4}$	1
$\frac{\pi}{2}$	0
$\frac{3\pi}{4}$	-1
π	und.
$\frac{5\pi}{4}$	1
$\frac{3\pi}{2}$	0

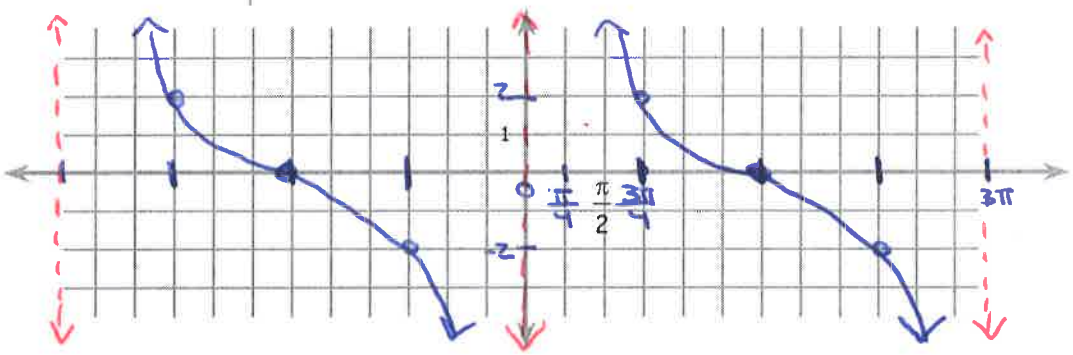




Domain: $\mathbb{R}$ except $x = n\pi$ where n is an integer	
Range: $(-\infty, \infty)$	Period: π

2. $y = 2\cot\left(\frac{x}{3}\right)$

* Horizontal Stretch
* Vertical Stretch



Amplitude: NONE *There is only an amplitude for sinusoidal functions*	Phase Shift: 0	Important Values: $\frac{3\pi}{4}$
Period: $\frac{\pi}{\frac{1}{3}} = 3\pi$	Vertical Shift: 0	Reflection? no; function decreases like the parent

Use a calculator to graph the function. Then use the graph of the function to approximate the solutions to the equation on the interval $[-2\pi, 2\pi]$. Round 3 decimal places. * Radian Mode

3. $\tan x = 3$

$Y_1 = \tan(x)$

$Y_2 = 3$

$x \approx -5.034$
$x \approx -1.893$
$x \approx 1.249$
$x \approx 4.391$

4 intersections

* move the cursor on the horizontal line

window
Xmin: -2π
Xmax: 2π
Ymin: -5
Ymax 5

4. $\cos x = -\frac{1}{3}$

$x \approx -4.373$
$x \approx -1.911$
$x \approx 1.911$
$x \approx 4.373$

Xmin: -2π
Xmax: 2π
Ymin: -0.5
Ymax: 0.5