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Graphs & Inverses of Trig Functions
5 – Parent Graphs of Secant & Cosecant

Periodic Function
A function in which for some real number α, $f(x + \alpha) = f(x)$ for each x in the domain of f.

$$y = A\sec\left[K(\theta - PS)\right] + VD$$

$$y = A\csc\left[K(\theta - PS)\right] + VD$$

A
A = the coefficient of the trig function. This determines the vertical stretching and shrinking of a graph. It also determines if the graph is reflected over the midline.

~~**Amplitude**~~
~~Amplitude of Sine and Cosine = $|A|$ = half the distance between the minimum and maximum values of the range of a periodic function with a bounded range.~~

Vertical Displacement
VD = the vertical translation

Midline
The horizontal axis used as the reference line about which the graph of a periodic function oscillates.

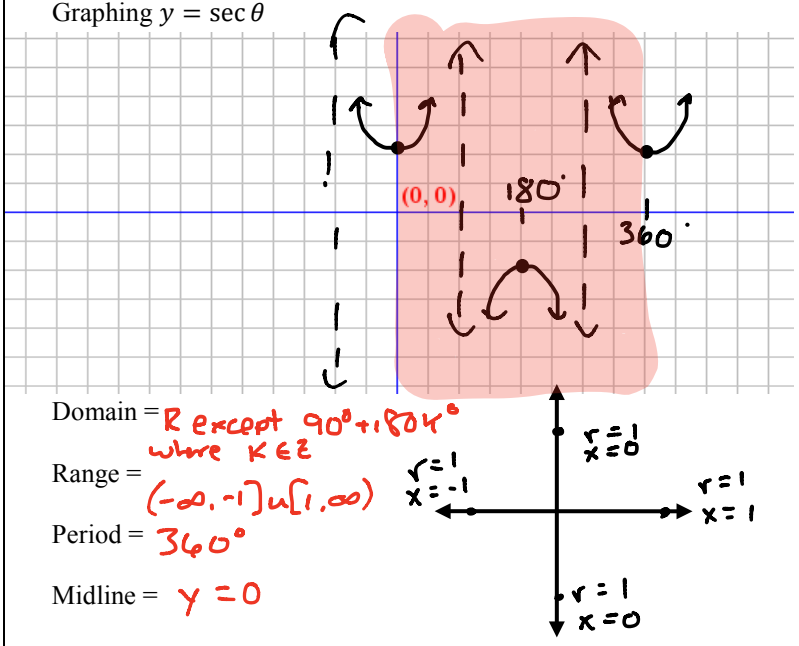
Period
P = the horizontal length of the unique part of the graph.

Phase Shift
PS = the horizontal translation.

Domain for trig functions
all the angles that can be put into the function (all the numbers included from left to right).

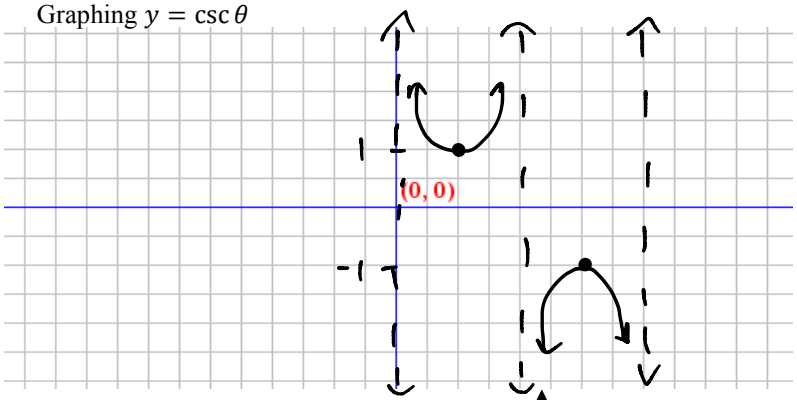
Range for trig functions
all the values that come out of the function (all the numbers included from bottom to top).

Graphing $y = \sec\theta$



Domain = R except $90° + 180k°$ where $k \in \mathbb{Z}$
Range = $(-\infty, -1] \cup [1, \infty)$
Period = $360°$
Midline = $y = 0$

Graphing $y = \csc\theta$



Domain = R except $180k°$ where $k \in \mathbb{Z}$
Range = $(-\infty, -1] \cup [1, \infty)$
Period = $360°$
Midline = $y = 0$

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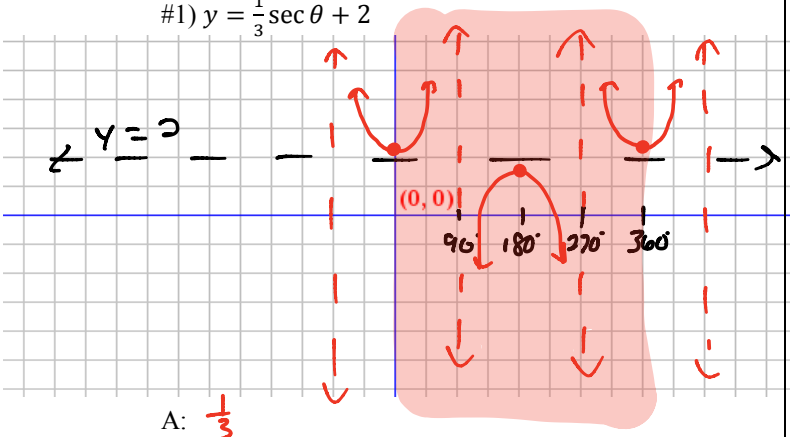
Graphs & Inverses of Trig Functions

5 – Parent Graphs of Secant & Cosecant

Graph a minimum of one period for each function.
Use DEGREES.

#1) $y = \frac{1}{3}\sec\theta + 2$



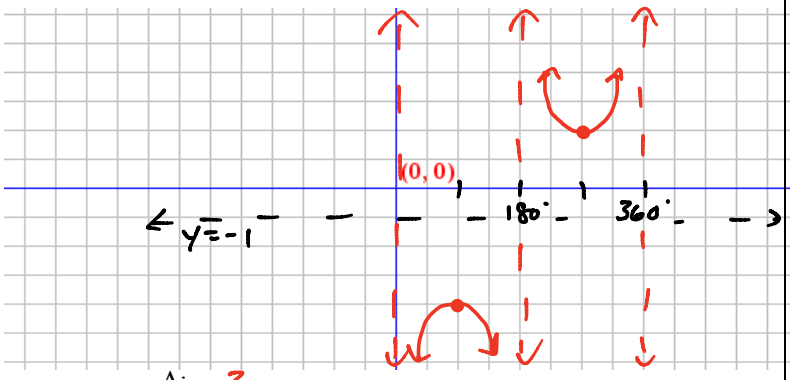
A: $\frac{1}{3}$
~~Amplitude~~:
Reflected over midline? NO

Vertical Displacement: 2
Midline: $y=2$

Phase Shift: 0

Period: 360

#2) $y = -3\csc\theta - 1$



A: -3
~~Amplitude~~:
Reflected over midline? Yes

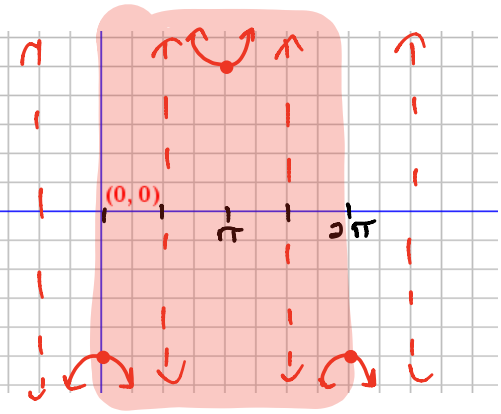
Vertical Displacement: -1
Midline: $y=-1$

Phase Shift: 0

Period: 360°

Graph a minimum of one period for each function.
Use RADIANS

#1) $y = -5\sec\theta$



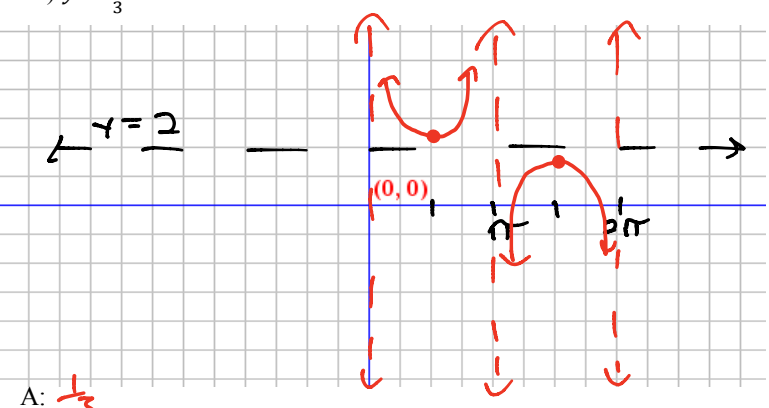
A: -5
~~Amplitude~~:
Reflected over midline? Yes

Vertical Displacement: 0
Midline: $y=0$

Phase Shift: 0

Period: 2π

#2) $y = \frac{1}{3}\csc\theta + 2$



A: $\frac{1}{3}$
~~Amplitude~~:
Reflected over midline? NO

Vertical Displacement: 2
Midline: $y=2$

Phase Shift: 0

Period: 2π