

Graphing a piecewise-defined function: Problem type 1

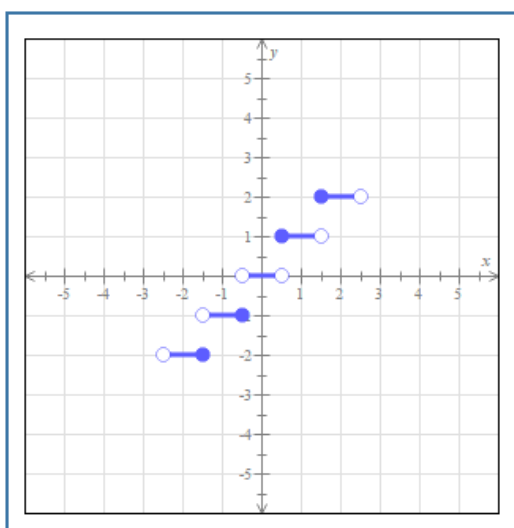
Suppose that the function f is defined on the interval $(-2.5, 2.5)$ as follows.

$$f(x) = \begin{cases} -2 & \text{if } -2.5 < x \leq -1.5 \\ -1 & \text{if } -1.5 < x \leq -0.5 \\ 0 & \text{if } -0.5 < x < 0.5 \\ 1 & \text{if } 0.5 \leq x < 1.5 \\ 2 & \text{if } 1.5 \leq x < 2.5 \end{cases}$$

Graph the function f .

The function f is defined piecewise. This means that it is defined according

The graph of f is the union of the graphs above.



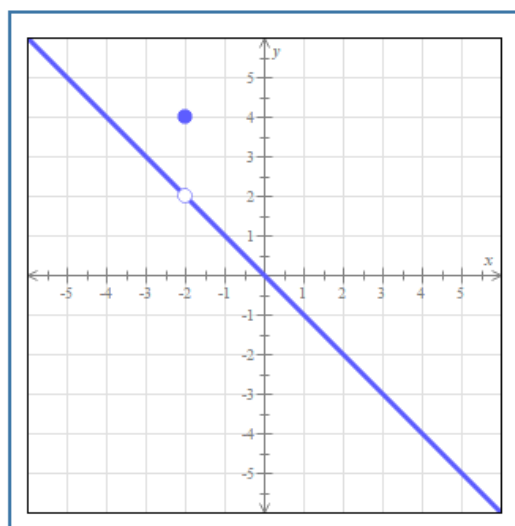
Graphing a piecewise-defined function: Problem type 1

Suppose that the function h is defined, for all real numbers, as follows.

$$h(x) = \begin{cases} -x & \text{if } x \neq -2 \\ 4 & \text{if } x = -2 \end{cases}$$

Graph the function h .

The graph of h is the union of the graphs above.



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The graph, domain, and range of a logarithmic function

Graph the function $g(x) = \log_3(x-3)$ and give its domain and range using interval notation.

$$x = 6$$

$$\log_3 3 = 1 = y$$

The graph of $g(x) = \log_3(x-3)$ is a transformation of the graph of $f(x) = \log_3 x$.

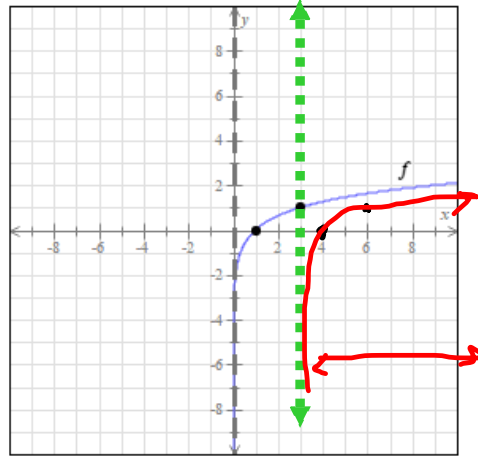
So let's first consider the graph of $f(x) = \log_3 x$.

It passes through the points (1, 0) and (3, 1).

It has a vertical asymptote $x = 0$.

The domain is $(0, \infty)$ and the range is $(-\infty, \infty)$.

[More](#)



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Using a calculator to approximate cosecant, secant, and cotangent values

Use the ALEKS calculator to evaluate each expression.

Round your answers to the nearest hundredth.

For each expression, make sure you are in the correct calculator mode.

$$\sec(-330^\circ) = \square \quad 1/\cos(-330^\circ)$$

$$\csc \frac{10\pi}{9} = \square \quad 1/\sin(10\pi/9)$$

$$\cot \pi = \square$$

$$\sec(-330^\circ) = 1.15$$

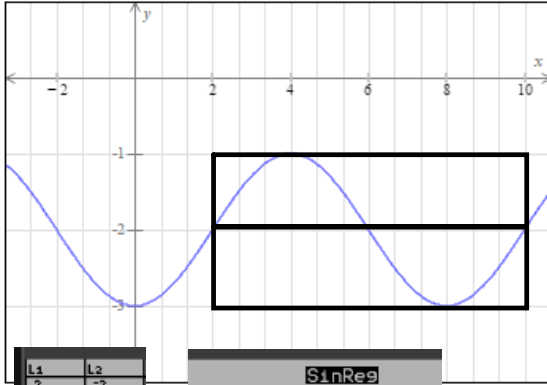
$$\csc \frac{10\pi}{9} = -2.92$$

$$\cot \pi = \text{Undefined}$$

19.

Writing the equation of a sine or cosine function given its graph: Problem type 2

Write the equation of a sine or cosine function to describe the graph.



L1	L2
2	1.570796327
4	1.570796327
6	1.570796327
8	1.570796327
10	1.570796327

SinReg

$y = a \sin(bx + c) + d$

a = 1

b = .7853981634

c = -1.570796327

d = -2

amplitude: $1 = A$

Period = $8 = 2\pi/B$

$B = \pi/4$

PS = $2 = -C/B$

$c = -2B = -\pi/2$

Lowered: $-2 = D$

regression

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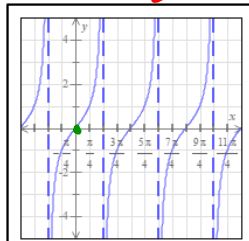
Matching graphs and equations for secant, cosecant, tangent, and cotangent functions

Three graphs are given below. For each, choose its equation from the following.

$\tan 0 = 0$

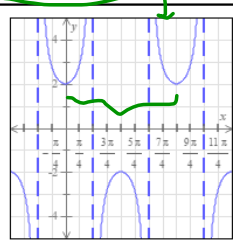
$\cot 0 = \text{undef}$

- $y = \csc x$
- $y = 2 \sec x$
- $y = \tan x$
- $y = \tan(x - \frac{\pi}{4})$
- $y = -\cot x$
- $y = 2 \sec 2x$

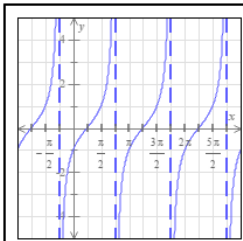


tan with period pi

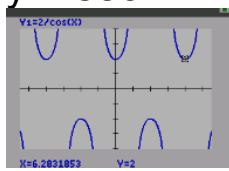
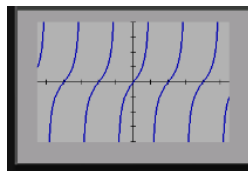
Equation:
(Choose one)
 $y = \tan x$



period = 2π
regular sec
Equation:
(Choose one)
 $y = 2 \sec x$



Equation:
(Choose one)
 $y = \tan(x - \pi/4)$



Matching graphs and equations for secant, cosecant, tangent, and cotangent functions

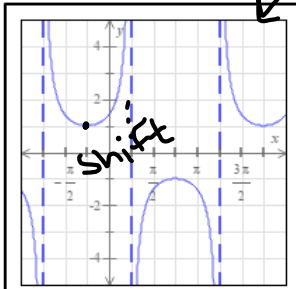
Three graphs are given below.
For each, choose its equation from the following.

$\cot(0) = 1/\tan(0)$
= undefined

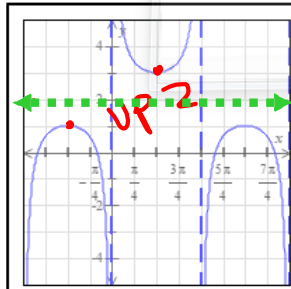
$y = -\cot x$ $y = \sec x$ $y = 2 + \csc x$
 $y = \tan x$ $y = \cot(x - \frac{\pi}{4})$ $y = \sec(x + \frac{\pi}{4})$

sec or csc

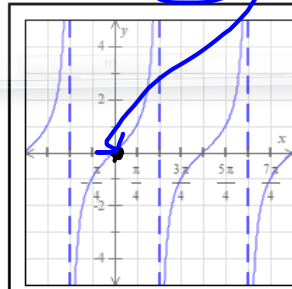
cot or tan



Equation:
(Choose one) ▼



Equation:
(Choose one) ▼



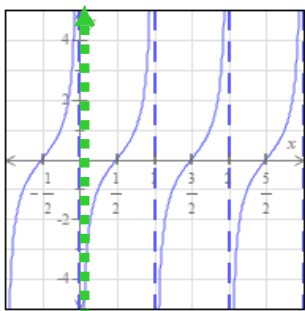
Equation:
(Choose one) ▼

$y = \tan(x - \frac{\pi}{2})$ $y = \csc \frac{\pi x}{2}$ $y = \tan \frac{\pi x}{2}$
 $y = 2 \sec \frac{\pi x}{2}$ $y = -\cot \frac{\pi x}{2}$ $y = 2 \csc \frac{\pi x}{2}$

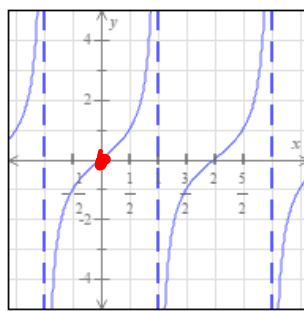
tan or cot

tan or cot

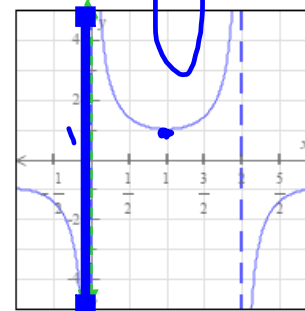
sec or csc



Equation:
(Choose one) ▼



Equation:
(Choose one) ▼



Equation:
(Choose one) ▼

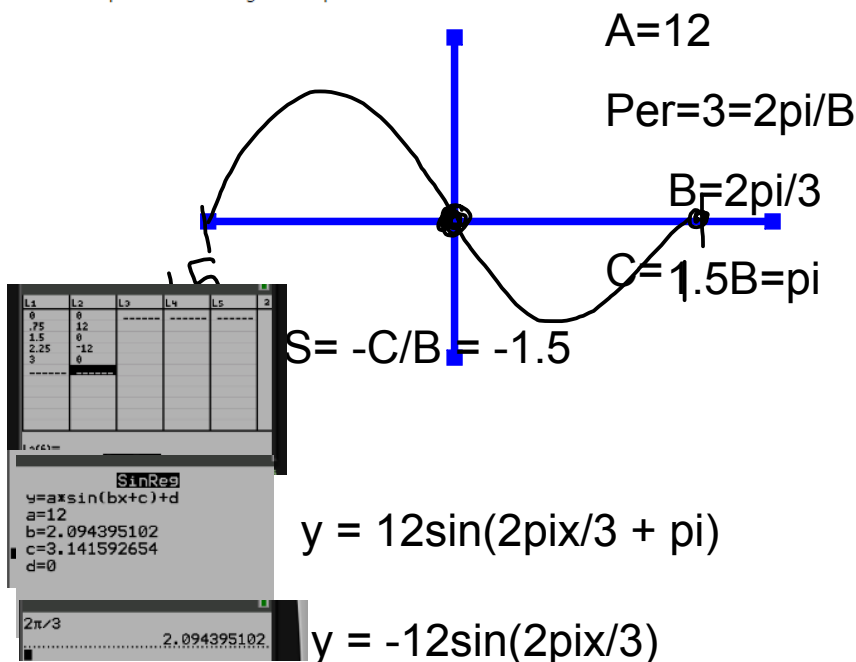
Trig Inverses (12 topics, due on 11/09/2016)

- Sketching the graph of $y = a \sin(x+c)$ or $y = a \cos(x+c)$
- Sketching the graph of $y = a \sin(bx)$ or $y = a \cos(bx)$
- Sketching the graph of $y = a \sin(bx+c)$ or $y = a \cos(bx+c)$
- Sketching the graph of $y = a \sin(bx) + d$ or $y = a \cos(bx) + d$
- Word problem involving a sine or cosine function: Problem type 1
- Values of inverse trigonometric functions
- Composition of a trigonometric function with its inverse trigonometric function: Problem type 2
- Composition of a trigonometric function with the inverse of another trigonometric function: Problem type 1
- Composition of a trigonometric function with the inverse of another trigonometric function: Problem type 2
- Composition of a trigonometric function with the inverse of another trigonometric function: Problem type 3
- Composition of trigonometric functions with variable expressions as inputs: Problem type 1
- Using a calculator to approximate inverse trigonometric values

Word problem involving a sine or cosine function: Problem type 1

A buoy floating in the sea is bobbing in simple harmonic motion with period 3 seconds and amplitude 12 in. Its displacement d from sea level at time $t = 0$ seconds is 0 in, and initially it moves downward. (Note that downward is the negative direction.)

Give the equation modeling the displacement d as a function of time t .



Values of inverse trigonometric functions

Find the exact value of $\sin^{-1}\left(\frac{\sqrt{3}}{2}\right)$.
 Write your answer in radians in terms of π .

$\sin(60^\circ) = \sqrt{3}/2$

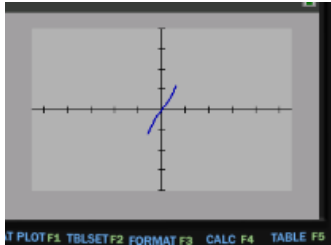
60°

$\sin^{-1}(\sqrt{3}/2)$	60
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$\sin^{-1}(\sqrt{3}/2)$	1.047197551
$\pi/3$	1.047197551

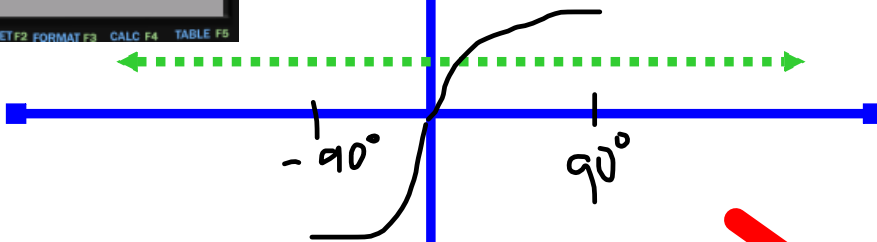
$\frac{60}{180} \pi = \frac{\pi}{3}$

arcsin domain $[-1, 1]$



range: $[-90^\circ, 90^\circ]$

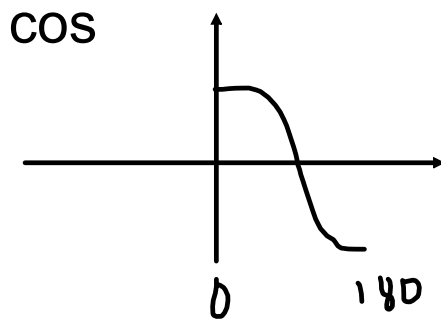
sine



~~pass HLT~~

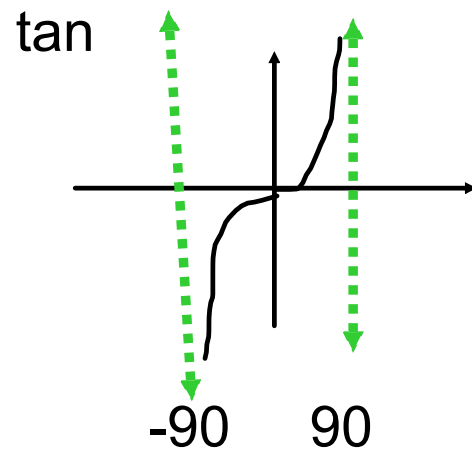
domain: $[-90^\circ, 90^\circ]$

range: $[-1, 1]$



domain $[0, 180]$

range $[-1, 1]$



domain $[-90, 90]$

range: $(-\infty, \infty)$