AP Precalc

Write your questions and thoughts here!

3.11 Secant, Cosecant, Cotangent Functions

3.11 Notes

RECIPROCAL TRIG FUNCTIONS

Cosecant	Secant	Cotangent
$\csc x =$	$\sec x =$	$\cot x =$

Find the exact value of the following expressions.

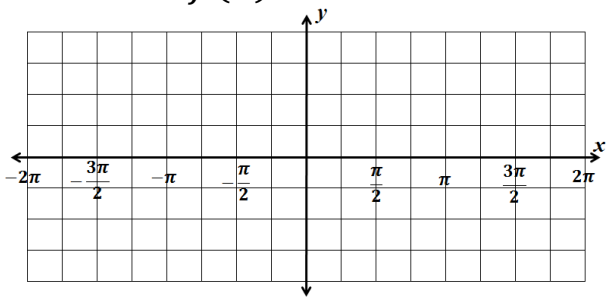
$\csc\left(\frac{\pi}{6}\right)$	$\sec\left(\frac{3\pi}{4}\right)$	$\cot\left(\frac{4\pi}{3}\right)$

Find the approximate value of the following expressions.

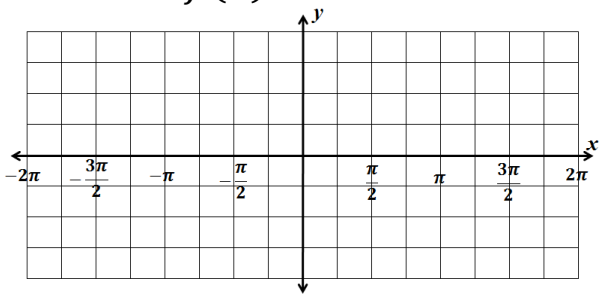
$\csc\left(\frac{\pi}{5}\right)$	$\sec(-1.43)$	$\cot(\pi)$

Graphs of reciprocal trig functions.

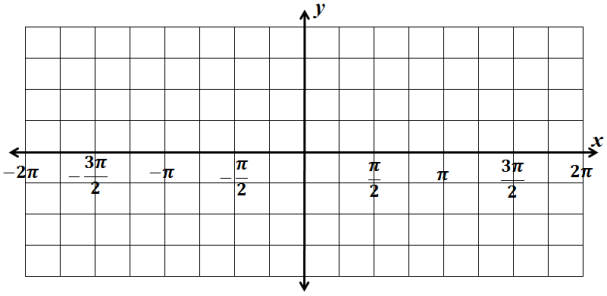
$f(x) = \csc x$



$f(x) = \sec x$



$f(x) = \cot x$



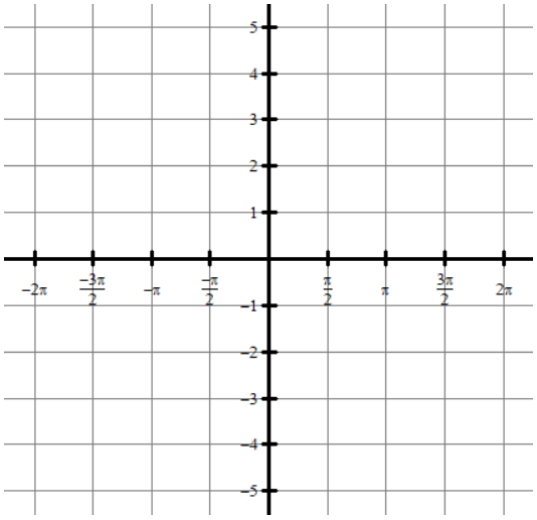
Write your questions and thoughts here!

Graph the following. State the range and all vertical asymptotes.

$f(x) = 3\sec x - 1$

Range:

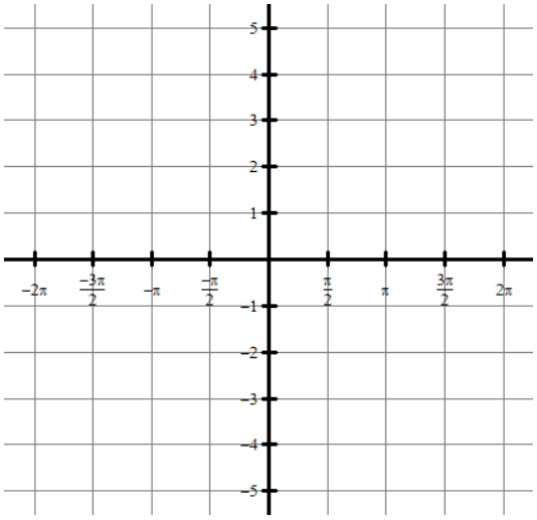
Vertical Asymptotes:



$f(x) = 2\csc\left(x - \frac{\pi}{2}\right) + 1$

Range:

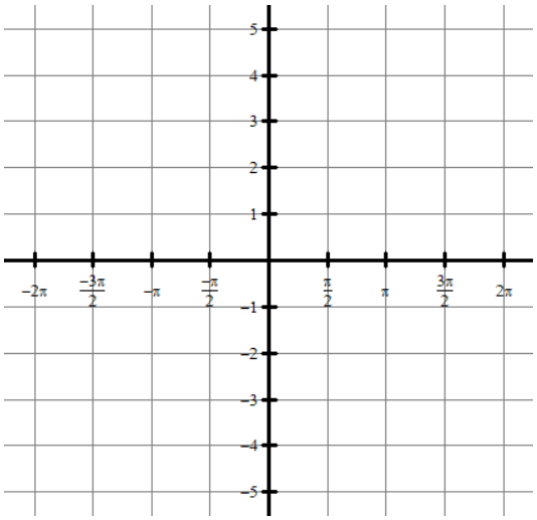
Vertical Asymptotes:



$f(x) = 2\cot\big(2(x + \pi)\big)$

Range:

Vertical Asymptotes:



3.11 Secant, Cosecant, and Cotangent Functions

AP Precalculus

3.11 Practice

Evaluate the following expressions. Use exact values.

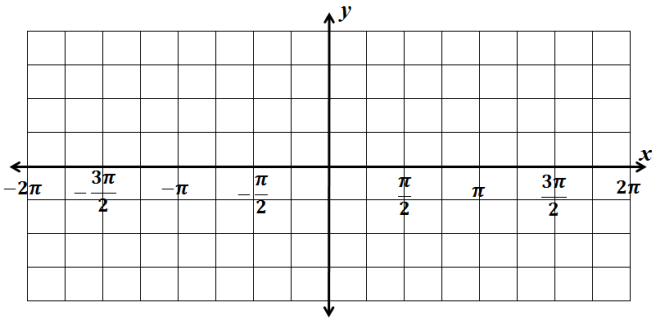
1. $\sec\left(\frac{\pi}{3}\right)$	2. $\csc\left(\frac{\pi}{4}\right)$	3. $\cot\left(\frac{3\pi}{2}\right)$
4. $\sec\left(\frac{7\pi}{6}\right)$	5. $\csc\left(-\frac{2\pi}{3}\right)$	6. $\cot\left(\frac{3\pi}{4}\right)$
7. $\csc(\pi)$	8. $\sec\left(\frac{5\pi}{4}\right)$	9. $\cot\left(\frac{5\pi}{3}\right)$

Evaluate the following expressions. Use approximate values from calculator.

10. $\csc(1.43)$	11. $\sec\left(\frac{\pi}{5}\right)$	12. $\cot\left(\frac{5\pi}{7}\right)$
13. $\sec(1.3\pi)$	14. $\cot(-3.26)$	15. $\csc\left(\frac{\pi}{9}\right)$

Graph the following and state all vertical asymptotes.

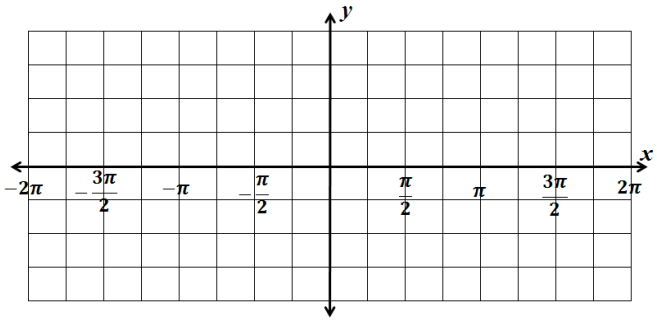
16. $f(x) = 2\csc x$



Range:

Vertical Asymptotes:

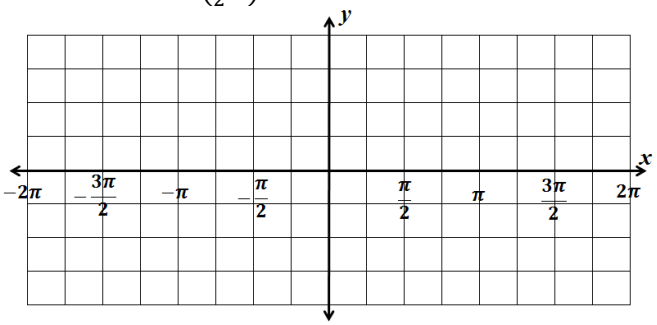
17. $f(x) = \sec(x) - 1$



Range:

Vertical Asymptotes:

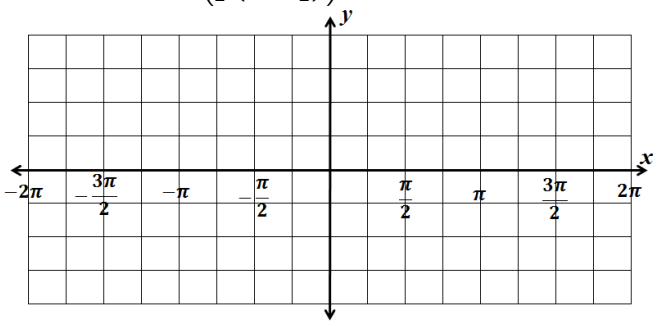
18. $f(x) = \cot\left(\frac{1}{2}x\right)$



Range:

Vertical Asymptotes:

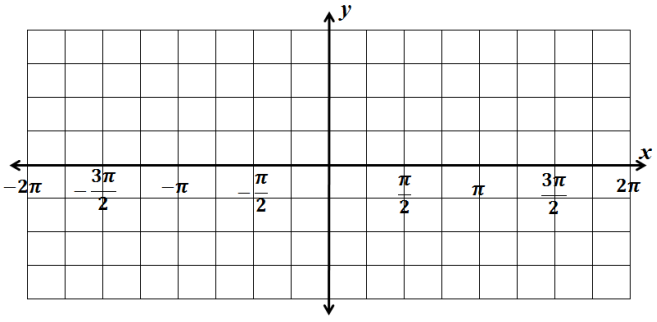
19. $f(x) = 2\csc\left(\frac{1}{2}\left(x - \frac{\pi}{2}\right)\right)$



Range:

Vertical Asymptotes:

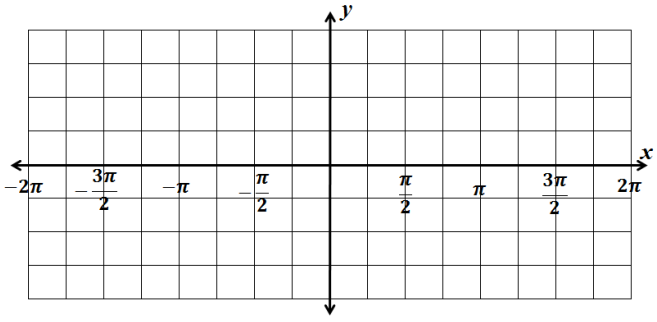
20. $f(x) = 2\cot(x) - 1$



Range:

Vertical Asymptotes:

21. $f(x) = \sec(2x) + 1$

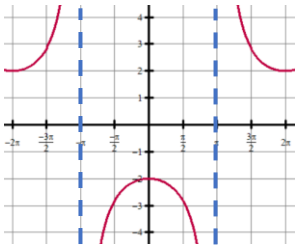


Range:

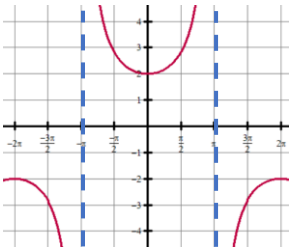
Vertical Asymptotes:

21. Which of the following is the graph of $f(x) = -2\csc\left(\frac{1}{2}x\right)$?

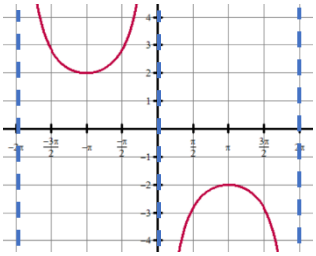
(A)



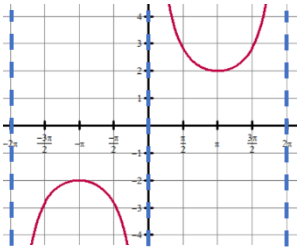
(B)



(C)

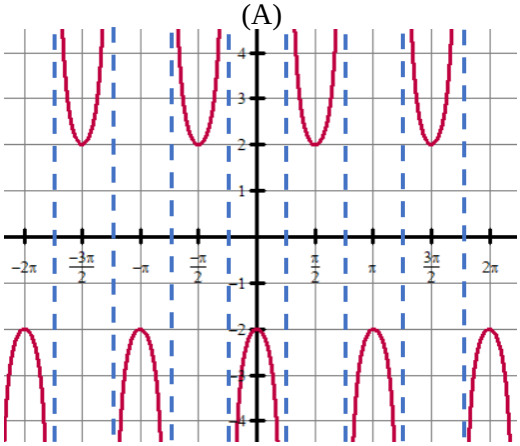


(D)

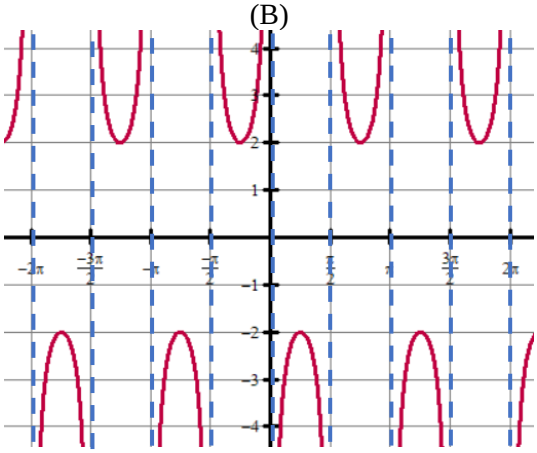


22. Which of the following is the graph of $f(\theta) = 2\sec\left(2\left(\theta + \frac{\pi}{2}\right)\right)$?

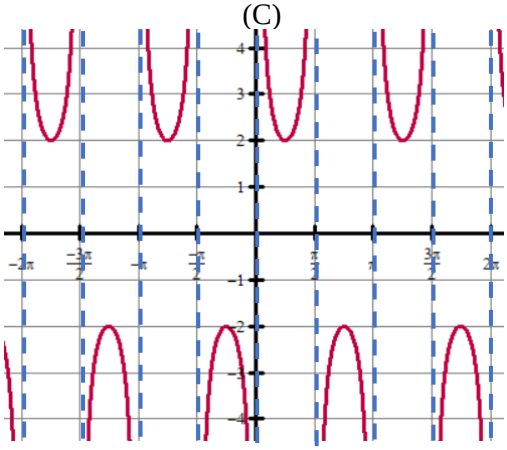
(A)



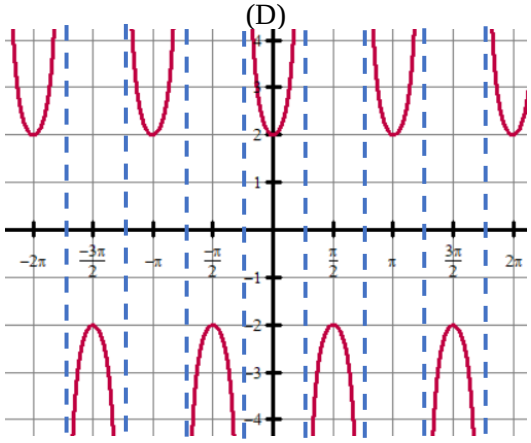
(B)



(C)



(D)



23. Which of the following describes the graph of $f(x) = 2\cot x$?

(A) Vertical asymptotes at $x = \frac{\pi}{2} + \pi k$, where k is an integer, and the range is all real numbers.

(B) Vertical asymptotes at $x = \frac{\pi}{2} + \pi k$, where k is an integer, and the range is $(-\infty, -2] \cup [2, \infty)$.

(C) Vertical asymptotes at $x = \pi + \pi k$, where k is an integer, and the range is all real numbers.

(D) Vertical asymptotes at $x = \pi + \pi k$, where k is an integer, and the range is $(-\infty, -2] \cup [2, \infty)$.