SM 3H

7.5 Graphing Cosecant & Secant Functions

2023-2024

SCORE: /

Name _____ Date _____ Period _____

Find the exact value of each expression.

1. $\sec\left(\frac{\pi}{3}\right)$

2. $\csc\left(-\frac{\pi}{4}\right)$

3. $\sec\left(\frac{\pi}{2}\right)$

4. $\csc(\pi)$

Find the approximate value of each expression to the nearest tenth.

5. $\sec(1.56)$

6. $\csc(0.01)$

Determine the period and range of each function.

7. $f(x)=\csc\left(\frac{3x}{2}\right)$

8. $f(x)=\sec(2\pi x)$

9. $f(x)=2\sec(x)$

10. $f(x)=\frac{1}{3}\csc(x)$

Sketch at least one cycle of the graph of each function. Determine the period, asymptotes, and the range of each function. Make a table of the key points.

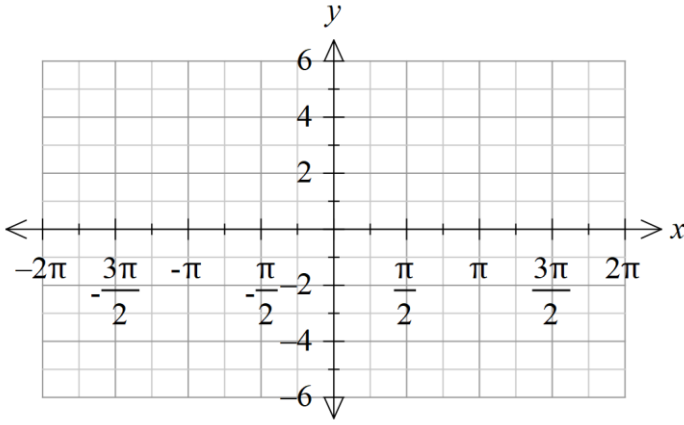
11. $f(x)=2\sec(x)$

x	$f(x)$

period_____

asymptotes_____

range_____



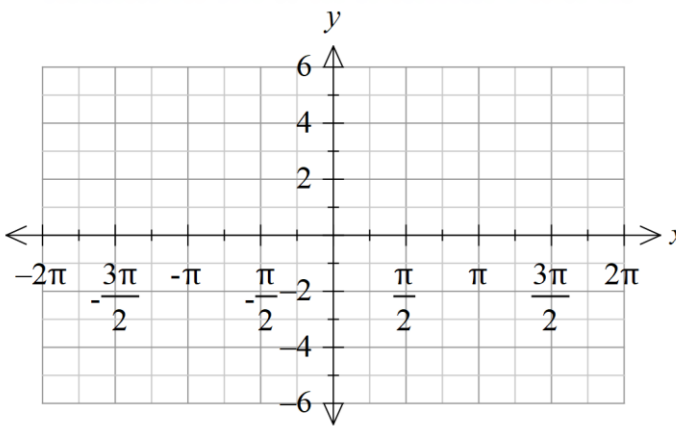
12. $f(x)=\sec\left(x+\frac{\pi}{4}\right)$

x	$f(x)$

period_____

asymptotes_____

range_____



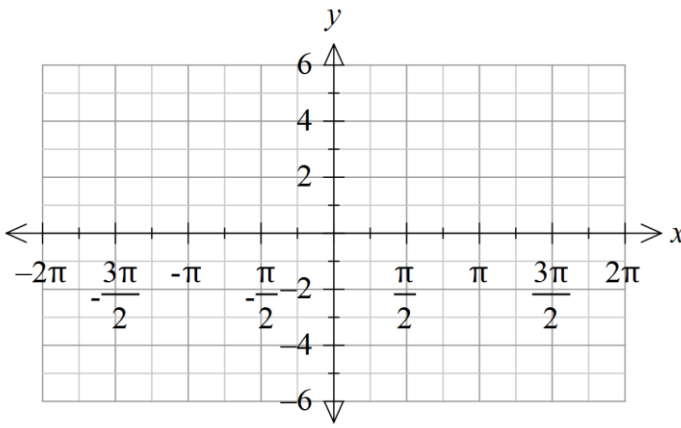
13. $f(x)=2+2\sec(2x)$

x	$f(x)$

period_____

asymptotes_____

range_____



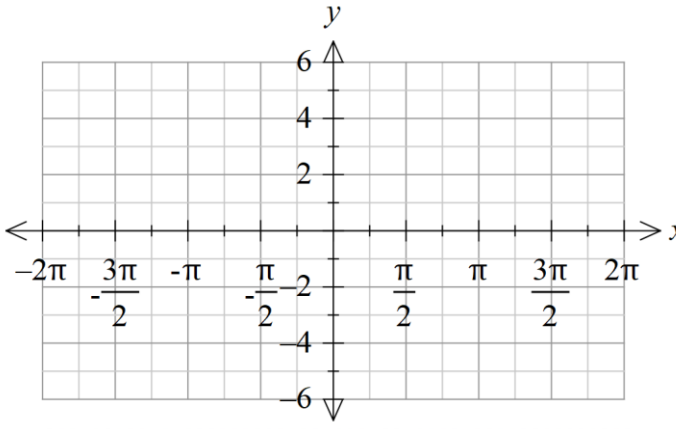
14. $f(x)=-\csc\left(x+\frac{\pi}{2}\right)$

x	$f(x)$

period_____

asymptotes_____

range_____



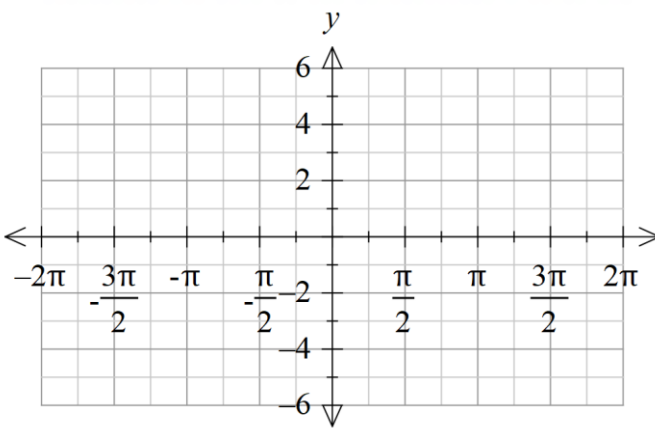
15. $f(x)=\csc\left(2x-\frac{\pi}{2}\right)$

x	$f(x)$

period_____

aysmptotes_____

range_____



Write an equation for each curve in its final position.

16. The graph of $f(x)=\sec(x)$ is shifted $\frac{\pi}{2}$ units to the right and 1 unit upward.

17. The graph of $f(x)=\csc(x)$ is reflected across the x-axis, shifted 1 unit to the left, then shifted 4 units upward.

Find the equations for all vertical asymptotes for each function.

18. $f(x)=-\sec(x)$

19. $f(x)=\frac{1}{2}\csc(2x)+4$

Review Exercises (Show all work!)

Convert each angle from degrees to radians.

20. $48°$

21. $18°$

Convert each angle from radians to degrees.

22. $\frac{17\pi}{12}$

23. $\frac{5\pi}{4}$

Find the length of the arc intercepted by the given central angle α in a circle of radius r. Round answers to nearest tenth.

24. $\alpha = 1, \quad r = 4\,cm$

25. $\alpha = 60°, \quad r = 2\,m$

Read each story and write the appropriate trigonometric function that applies.

26. A buoy oscillates up and down as waves go past. The buoy moves a total of 3.6 feet from its low point to its high point, and then returns to its high point every 8 seconds. Write a sine function modeling the buoy's vertical position at any time *t*.

27. A Ferris wheel 50 feet in diameter makes one revolution every 40 seconds. The center of the wheel is 30 above the ground. People load at the bottom of the Ferris wheel. Write a cosine functions to model the height of a car on the Ferris wheel at any time *t*.

28. Low tide is at 10:15 am and high tide is at 4:15 pm. The water level varies 64 inches between low and high tide. Write a cosine function to represent the change in water level.

29. The lowest pitch a human can easily hear has a frequency of 30 cycles per second. Write a sine function representing the sound wave of the pitch. (Amplitude is 1.)

30. The highest pitch a human can easily hear has a frequency of 20,000 cycles per second. Write a sine function representing the sound wave of the pitch. (Amplitude is 1.)

31. In Buenos Aires, Argentina, the average monthly temperature is the highest in January and the lowest in July. It ranges from $76°\text{F}$ to $51°\text{F}$. Write a cosine function that models the change in temperature according to the month of the year.