SM 3H

2023-2024

Unit 7 Test Review

SCORE: /

Name _____ Date _____ Period _____

Draw and label the triangles with the given measures, then solve them. If there is more than one triangle with the given measures, give both solutions. Round your answers to the nearest tenth.

1. $A = 41.2°, a = 8.1$ cm, $b = 10.6$ cm

2. $\beta = 75.3°,\ b = 12.4$ mi, $c = 9.8$ mi

3. $\gamma = 37.9°,$ a $= 15.3$ ft, $c = 6.1$ ft

Solve the problem. Round to the nearest tenth.

4. To find the distance $\overline{AB}$ across a river, a distance $\overline{BC} = 923$ m is laid off on one side of the river. It is found that $B = 113.4°$ and $C = 12.5°$. Find $\overline{AB}$.

Draw and label the triangles with the given measures, then solve them. If there is more than one triangle with the given measures, give both solutions. Round your answers to the nearest tenth.

5. $\gamma = 84.9°,\ a = 7.28$ km, $b = 8.51$ km

6. $a = 6.2$ yd, $b = 12.5$ yd, $c = 13.8$ yd

Solve the problem.

7. To find the distance between two small towns, an electronic distance measuring (EDM) instrument is placed on a hill from which both towns are visible. If the distance from the EDM to the towns is 3.6 miles and 5.7 miles and the angle between the two lines of sight is 53°, what is the distance between the towns? Round your answer to the nearest tenth of a mile.

Find the area of triangle *ABC*. Round to the nearest tenth.

8. $\alpha = 15.0°,\ b = 10.7$ yd, $c = 7.3$ yd

9. $B = 56°,\ \mathrm{A} = 85°,\ \mathrm{a} = 9.5$ m

Solve the problems. Round to the nearest tenth.

10. The Aerial run in Snowbird, Utah, is 8395 feet long. Its vertical drop is 2900 feet. If the slope were constant, estimate the angle of elevation that the run makes with the ground.

11. A medical rescue helicopter has flown 45 miles from its home base to pick up an accident victim and 35 miles from there to the hospital. Then angle between the two legs of the trip was 125°. The pilot needs to know how far he is now from his home base so he can decide whether to refuel before returning. How far is the hospital from the helicopter's base?

12. Jack wants to cement a pole into the ground so he can use it to build gazebo. He wants to use two pieces of rope to hold the pole in place while the cement is drying. The two pieces of rope are on opposite sides of the pole and are 38 feet apart. The angle of elevation for each rope from the ground is 33° and 24°. Find the length of each piece of rope.

13. Squints is in the treehouse looking at the baseball. The Beast, which is just past the baseball, is 13 feet from the baseball. The angle of depression from Squints line of sight to The Beast is 38° and to the baseball is 54°. What is the distance of the baseball to the bottom of the tree which holds the treehouse?

14. Two trains leave the station at the same time. One train travels on a bearing of N 36° E at 32 mph. The other train travels on a bearing of S 65° W at 48 mph. To the nearest tenth of a mile, how far apart will the trains be after 4 hours?

No Graphing Calculators in this section

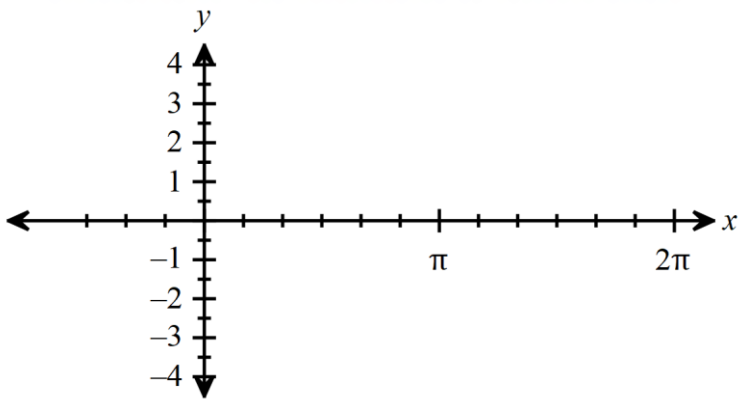
Determine the amplitude, phase shift, period, frequency, and range for each function. Make a table with the five key points and sketch at least one cycle of the graph with the five key points from the table.

15. $f(x)=3\cos\left(x-\frac{\pi}{6}\right)$ Amplitude: Phase shift:

x	$f(x)$

Period: Frequency:

Range:

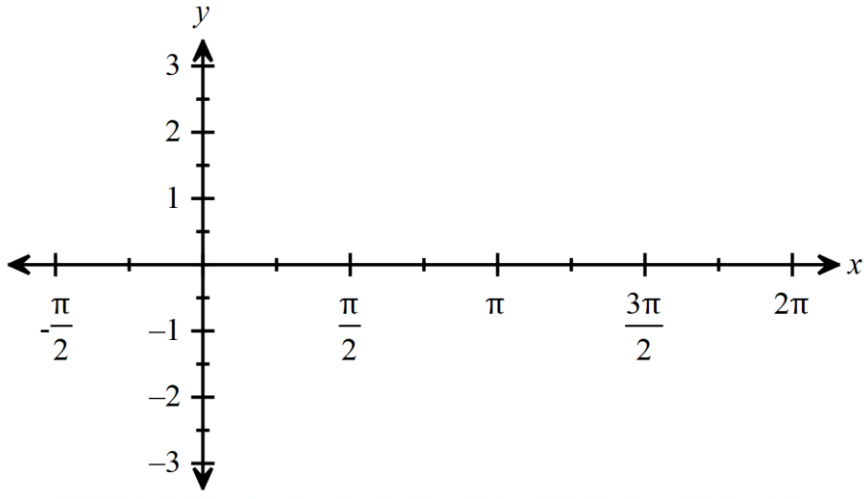


16. $f(x)=-\sin(2x)+1$ Amplitude: Phase shift:

x	$f(x)$

Period: Frequency:

Range:

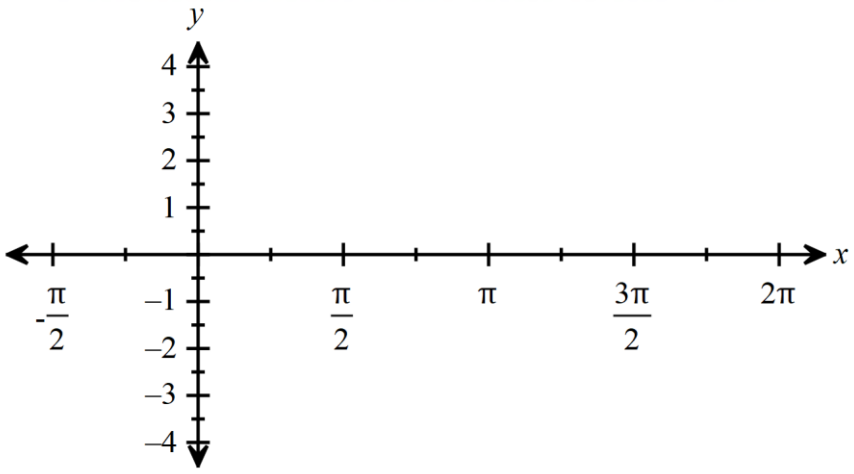


Sketch at least one cycle of the graph of each function. Determine the period, asymptotes, and the range of each function. Make a table with the five key points.

17. $f(x)=\sec\left(x+\frac{\pi}{4}\right)+2$ Period: Asymptotes:

x	$f(x)$

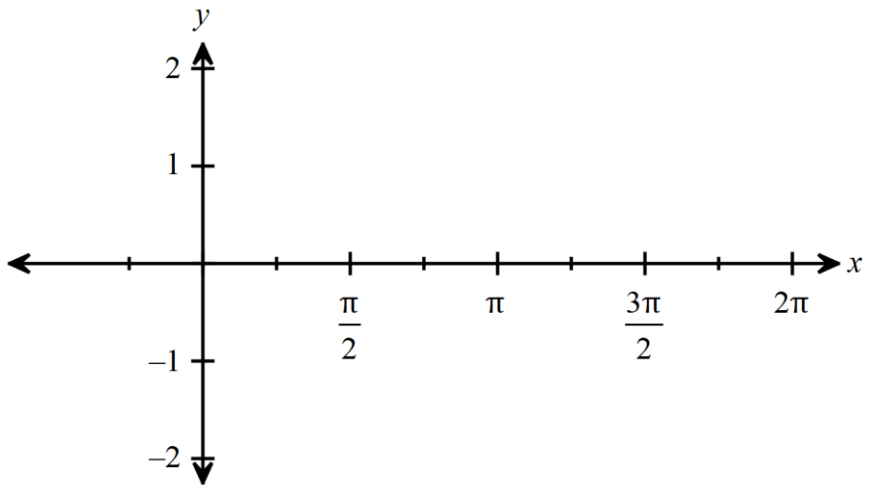
Range:



Sketch at least one cycle of the graph. Determine the period and the equation of the vertical asymptotes. Make a table with the five key points.

18. $f(x)=\frac{1}{3}\tan(x-\frac{\pi}{2})$ Period: Asymptotes:

x	$f(x)$



Write the equations for 19 & 20 in its final form using the given translations in the given order.

19. The graph of $y = \cot(x)$ is shifted $\frac{\pi}{4}$ units left, stretched by a factor of 3, and translated 2 units upward.

20. The graph of $y = \csc(x)$ is reflected across the x-axis, shifted right $\frac{\pi}{6}$, and downward one unit.

21. The point $\left(\frac{\pi}{2}, -1\right)$ is on a graph. What is the new location of the point if it is translated $\frac{\pi}{3}$ to the right, shifted up 4, and reflected across the y-axis? (HINT: Be sure to do the transformations in the correct order.)

22. What is the period of the given function?

$f(x) = 3\cot\left(\frac{x}{6}\right) - 2$ Period:

23. Low tide is at 5:30 am and high tide is at 11:30 am. The water level varies 22 inches between low and high tide. Write a cosine function to represent the change in water level.

24. The tallest Ferris wheel in the world is the High Roller Observation Wheel, which is a Ferris wheel in Las Vegas. It is 520 feet in diameter and makes one revolution every 30 minutes. The center of the wheel is 290 feet above the ground. People load at the bottom of the Ferris wheel. Write a cosine function to model the height of a car on the Ferris wheel at any time *t*.