Name: _____ Class: _____ Date: _____ ID: A

Precalculus: Study Guide for Trigonometric Functions Test

1. Determine the quadrant in which an angle, θ, lies if $\theta = \frac{13\pi}{12}$.

2. Determine the quadrant in which an angle, θ, lies if $\theta = \frac{8\pi}{3}$.

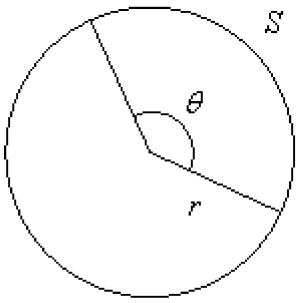
3. Determine the quadrant in which an angle, θ, lies if $\theta = \frac{-7\pi}{4}$.

4. Determine two coterminal angles (one positive and one negative) for $\theta = \frac{2\pi}{3}$.

5. Rewrite $315°$ in radian measure as a multiple of π.

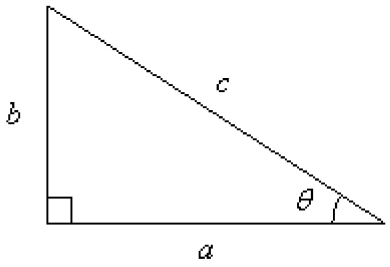
6. Rewrite $\frac{4\pi}{9}$ in degree measure.

7. Find the angle, in radians, in the figure below if $S = 12$ and $r = 8$.



8. Find the area of the sector of the circle with radius 4 centimeters and central angle $\frac{11\pi}{6}$.

9. Find the exact value of $\csc\theta$, using the triangle shown in the figure below, if $a = 24$ and $b = 7$.



10. Determine the following without a calculator: $\tan 30°$

11. Determine the following without a calculator: $\sec 45°$

12. Determine the following without a calculator: $\csc 60°$

13. If $\cos\theta = \frac{\sqrt{3}}{2}$, find the value of θ in degrees $(0 < \theta < 90°)$ without the aid of a calculator.

14. If $\sin\theta = \frac{\sqrt{2}}{2}$, find the value of θ in degrees $(0 < \theta < 90°)$ without the aid of a calculator.

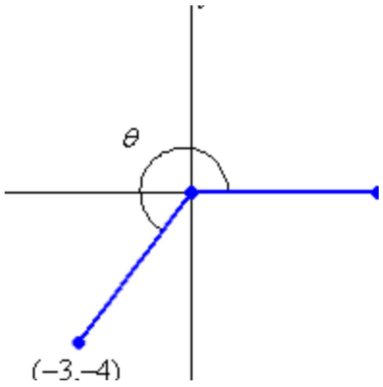
15. Determine θ and $\cos(\theta)$ when $\sin(\theta) = \frac{\sqrt{3}}{2}$ and $\cos(\theta)$ is negative. Restrict values for θ such that $0 \le \theta < 2\pi$.

16. Determine θ and $\sin(\theta)$ when $\cos(\theta) = -\frac{\sqrt{2}}{2}$ and $\sin(\theta)$ is negative. Restrict values for θ such that $0 \le \theta < 2\pi$.

17. Given $\sin(\theta) = \frac{5}{13}$ in Quadrant I, determine $\cos(\theta)$.

18. Given $\cos(\theta) = -\frac{7}{25}$ in Quadrant III, determine $\sin(\theta)$.

19. Given the figure below, determine the value of $\sin\theta$.



20. State the quadrant in which θ lies if $\sec\theta > 0$ and $\csc\theta < 0$.

21. State the quadrant in which θ lies if $\tan\theta > 0$ and $\sec\theta < 0$.

22. Given the equation below, determine two solutions such that $0 \le \theta < 2\pi$.

$\sec\theta = \frac{2\sqrt{3}}{3}$

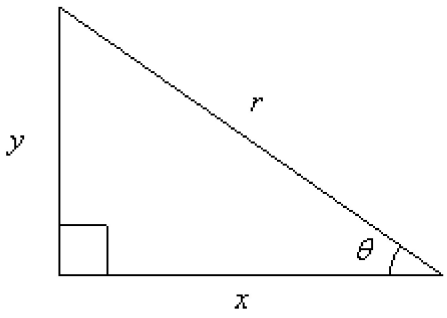
23. Given the equation below, determine two solutions such that $0 \le \theta < 2\pi$.

$\cot\theta = \sqrt{3}$

24. Given the equation below, determine two solutions such that $0 \le \theta < 2\pi$.

$\csc\theta = -2$

25. Using the figure below, if $\theta = 26°$ and $y = 8$, determine the exact value of x.



A) $x = \frac{13}{\tan 4°}$

B) $x = \frac{8}{\cot 26°}$

C) $x = \frac{8}{\tan 26°}$

D) $x = \frac{4}{\sin 13°}$

E) $x = \frac{26}{\csc 8°}$

26. Graph the function below to determine if the function is even, odd, or neither.

$y = \tan x$

27. Graph the function below to determine if the function is even, odd, or neither.

$y = \csc x$

28. Graph the function below to determine if the function is even, odd, or neither.

$y = \cos x$

29. Graph the function below to determine if the function is even, odd, or neither.

$y = \sin x$

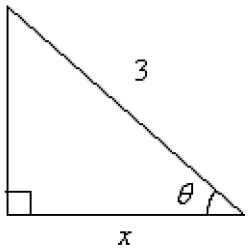
30. Evaluate $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)$ without using a calculator.

31. Evaluate $\tan^{-1}\left(-\frac{\sqrt{3}}{3}\right)$ without using a calculator.

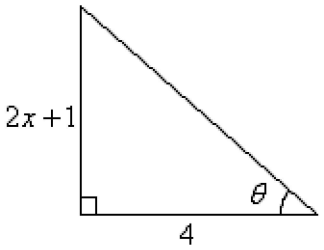
32. Evaluate $\arctan\frac{\sqrt{3}}{3}$ without using a calculator.

33. Evaluate $\arcsin\frac{\sqrt{3}}{2}$ without using a calculator.

34. Use an inverse function to write θ as a function of x.



35. Use an inverse function to write θ as a function of x.

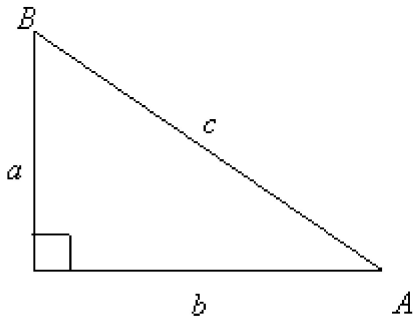


36. Use the properties of inverse trigonometric functions to evaluate $\sin\left[\arcsin(-0.63)\right]$.

37. Find the exact value of $\cos\left(\arctan\frac{11}{60}\right)$.

38. Find the exact value of $\csc\left(\arctan\frac{8}{15}\right)$.

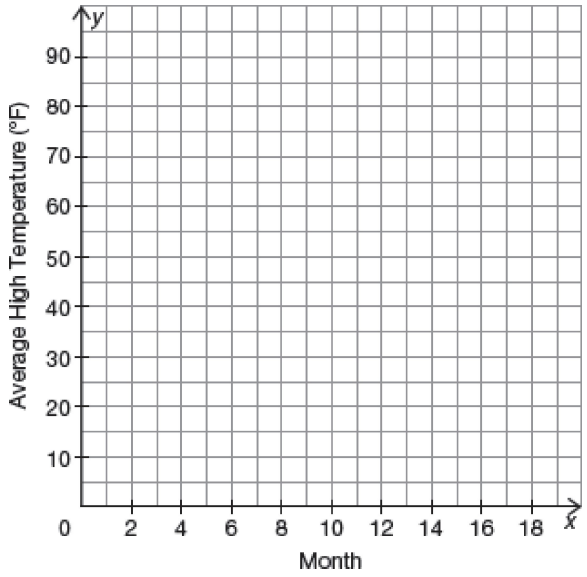
39. If $a = 5$ and $c = 20$, determine the value of A. Round to two decimal places. (Calculator required)



The table shows the average monthly high temperature for a town in Tennessee. This data can be modeled with a sine function.

Month	1	2	3	4	5	6	7	8	9	10	11	12
Average High Temperature (°F)	50	53	60	71	80	87	90	89	84	73	59	50

40. Plot the points from the table using the number of the month for your independent variable and the average high temperature for your dependent variable.



41. Determine the amplitude of the function that could be used to model this data. Explain your reasoning.

42. Determine the period of the function that could be used to represent this data. Explain your reasoning.

43. Use a graphing calculator to perform a sinusoidal regression for the data. Write the regression equation. Is this model a good fit for the data? Explain your reasoning.

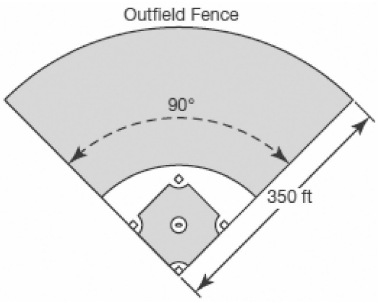
The height of a roller coaster can be modeled by the function $f(x) = 20\cos\left(\frac{\pi}{60}x\right) + 30$, where x represents the horizontal distance from the start of the ride in meters, and $f(x)$ represents the vertical height of the ride in meters.

44. Determine the amplitude of the function. What does it represent in terms of this problem situation?

45. Determine the period of the function. What does it represent in terms of this problem situation?

46. Determine the vertical shift of the function. What does it represent in terms of this problem situation?

47. The outfield fence on a baseball field needs to be replaced. The fence is an arc with its center at home plate and a central angle of 90°. The distance from home plate to any point on the fence is 350 feet.



a. Determine the central angle of the outfield fence in radians.

b. Determine the length of the outfield fence that needs to be replaced.