

Precalculus

4.3-4.4 Review

Name _____

- Find the exact values of the six trigonometric functions of the angle theta shown in the figure.

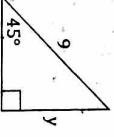
1.	$\sin \theta = \frac{8\sqrt{5}}{16}$	$\sin \theta = \frac{6\sqrt{2}}{11}$
	$\cos \theta = \frac{\sqrt{65}}{16}$	$\cos \theta = \frac{7}{11}$
	$\tan \theta = \frac{8}{\sqrt{65}}$	$\tan \theta = \frac{6\sqrt{2}}{7}$
	$\csc \theta = \frac{\sqrt{65}}{8}$	$\sec \theta = \frac{11}{7}$
	$\sec \theta = \sqrt{65}$	$\cot \theta = \frac{1}{8}$
		$\cot \theta = \frac{7\sqrt{2}}{12}$

3. List the three Pythagorean Identities.

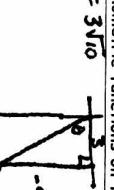
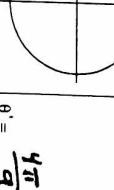
Sketch a right triangle corresponding to the trigonometric function of the acute angle theta. Find the remaining five trigonometric functions of theta.

4.	$\sin \theta = \frac{5}{6}$	$\sin \theta = \frac{3}{\sqrt{10}}$
	$\cos \theta = \frac{\sqrt{11}}{6}$	$\cos \theta = \frac{\sqrt{10}}{10}$
	$\tan \theta = \frac{5\sqrt{11}}{11}$	$\tan \theta = \frac{1}{3}$
	$\csc \theta = \frac{6}{5}$	$\csc \theta = \frac{\sqrt{10}}{3}$
	$\sec \theta = \frac{6\sqrt{11}}{11}$	$\sec \theta = \sqrt{10}$
		$\cot \theta = \frac{\sqrt{11}}{5}$

Find the exact values of the missing variables - x, y, or r.

6.		$\cos 45^\circ = \frac{x}{9}$
	$y = 9\sqrt{2}$	$x = \frac{9\sqrt{2}}{2}$
	$\sin 45^\circ = \frac{y}{9}$	$y = \frac{9\sqrt{2}}{2}$
	$\cos 45^\circ = \frac{x}{9}$	$x = \frac{\sqrt{2}}{2}(9\sqrt{2}) = 6\sqrt{3}$
		$r = \frac{12}{\sqrt{3}/2} = 8\sqrt{3}$

The point given is on the terminal side of an angle in standard position. Determine the exact values of the six trigonometric functions on the angle.

18.	(3, -9)	$r = 3\sqrt{10}$		19. (-5, 12) Q2
				$\sin \theta = \frac{12}{13}$
				$\cos \theta = \frac{-5}{13}$
				$\tan \theta = \frac{12}{-5} = -\frac{12}{5}$
				$\cot \theta = -\frac{5}{12}$
				$\sec \theta = -\frac{13}{5}$
				$\csc \theta = \frac{12}{13}$

Draw a picture to represent the situation and then solve.

9. A 16-foot ladder is leaning against a building. If the ladder forms a 38° angle with the ground, determine how high the ladder meets the building.



$$\sin 38^\circ = \frac{y}{16}$$

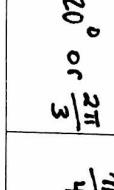
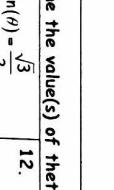
$$y = 9.851 \text{ ft.}$$

$$x = 11580.757 \text{ ft.}$$

$$\tan 38^\circ = \frac{y}{x} = \frac{20.42}{X}$$

10. Michael is looking at the top of a mountain. It is 2,050 feet high. If Mike is 6 feet tall (eye level) and he is looking up at a 10° angle, how far is he from the mountain?

$$\tan 10^\circ = \frac{2042}{x}$$

6.	$\theta = -240^\circ$		Determine the value(s) of theta in degrees ($0^\circ \leq \theta < 360^\circ$) and radians ($0 \leq \theta < 2\pi$). Left!
11.	$\sin(\theta) = \frac{\sqrt{3}}{2}$		12. $\tan(\theta) = 1$
			13. $\csc(\theta) = -2$ Think: $\sin \theta = \frac{1}{2}$ $\theta = 0^\circ \text{ or } 180^\circ$
			14. $\cot(\theta)$ is undefined $\theta = 90^\circ \text{ or } 270^\circ$
			15. $\theta = 45^\circ$
			16. $\theta = \frac{13\pi}{9}$
			17. $\theta = 500^\circ$
			18. $\theta = 60^\circ$
			19. $\theta = \frac{4\pi}{9}$
			20. $\theta = 30^\circ \text{ or } 150^\circ$

cos neg Q2,3 at Q2

20. Given $\sec \theta = -2$ and $0 \leq \theta \leq \pi$, find the values of the six trigonometric functions of θ . Q2!

21. Given $\cot \theta$ is undefined and $\frac{\pi}{2} \leq \theta \leq \frac{3\pi}{2}$, find the values of the six trigonometric functions of θ .



$$\begin{aligned}\cos \theta &= -\frac{1}{2} \\ \sin \theta &= \frac{\sqrt{3}}{2} \\ \tan \theta &= -\sqrt{3} \\ \cot \theta &= -\frac{\sqrt{3}}{3} \\ \csc \theta &= \frac{2\sqrt{3}}{3}\end{aligned}$$

Q1,2,3 at Q1

22. Given $\sin \theta = \frac{3}{5}$ and $\cot \theta < 0$. Q2,1
3-4-5 determine $\cos \theta$ and $\tan \theta$.

$$\begin{aligned}\text{Q1,2} \\ \text{Q2,3,4} \\ \text{Q1,3}\end{aligned}$$

23. Given $\cos \theta = -\frac{3\sqrt{10}}{10}$ and $\tan \theta > 0$. Q3!
determine $\csc \theta$ and $\tan \theta$.

$$\begin{aligned}\cos \theta &= -\frac{3}{5} & \tan \theta &= -\frac{3}{4} \\ \csc \theta &= -\sqrt{10} & \tan \theta &= \frac{1}{3}\end{aligned}$$

Evaluate the following trigonometric functions.

27. $\tan 300^\circ$

28. $\cot \left(\frac{15\pi}{4}\right)$

29. $\csc \frac{3\pi}{2}$

-1

-1

0

2

30. $\cos 9\pi$

-1

31. $\sin(-720^\circ)$

0

32. $\sec \frac{5\pi}{3}$

2

33. $\tan \theta / \cos \theta = \sin \theta$

Use trigonometric identities to transform one side of the equation into the other ($0 < \theta < 2\pi$).

34. $(1 + \cos \theta)(1 - \cos \theta) = \sin^2 \theta$

35. $\frac{\cot \theta \tan \theta}{\sin \theta} = \csc \theta$

36. $\frac{\sec^2 x}{1 + \tan^2 x} = 1 + \cos^2 x$

Evaluate the following trigonometric functions.

24. $\cos(135^\circ)$

25. $\sec \frac{\pi}{2}$

26. $\sin(-390^\circ)$

$-\frac{\sqrt{2}}{2}$

Undefined

$-\frac{1}{2}$