

Unit 1.3 Using Definitions of the Trigonometric Functions PRACTICE

Use the appropriate reciprocal identity to find each function value. Rationalize denominators when applicable.

- 1) $\cos \theta$, if $\sec \theta = -2.5$ -0.4 2) $\cot \theta$, if $\tan \theta = -\frac{1}{5}$ -5
- 3) $\sin \theta$, if $\csc \theta = 3$ $\frac{1}{3}$ 4) $\sec \theta$, if $\cos \theta = -\frac{\sqrt{7}}{7}$ $-\sqrt{7}$
- 5) $\sin \theta$, if $\csc \theta = \sqrt{15}$ $\frac{\sqrt{15}}{15}$ 6) $\tan \theta$, if $\cot \theta = -\frac{\sqrt{5}}{3}$ $\frac{-3\sqrt{5}}{5}$
- 7) $\sin \theta$, if $\csc \theta = 1.42716321$ 0.70069071 8) $\tan \theta$, if $\cot \theta = 9.80425133$ 0.10199657

9) Can a given angle θ satisfy both $\sin \theta > 0$ and $\csc \theta < 0$? Explain.

No, in quadrant I they are both positive, in quadrant II they are both positive, in quadrant III they are both negative, and in quadrant IV they are both negative.

10) Explain what is wrong with the following item that appears on a trigonometry test:

$$\text{Find } \sec \theta, \text{ given that } \cos \theta = \frac{3}{2}.$$

Cos cannot be more than 1.

11) What is wrong with the following statement? $\tan 90^\circ = \frac{1}{\cot 90^\circ}$

$\tan 90^\circ$ is undefined so it cannot be equal to anything.

Find a value of each variable.

- 12) $\tan(3\theta - 4^\circ) = \frac{1}{\cot(5\theta - 8^\circ)}$ 2° 13) $\sec(2\theta + 6^\circ) \cos(5\theta + 3^\circ) = 1$ 1°
- 14) $\sin(4\theta + 2^\circ) \csc(3\theta + 5^\circ) = 1$ 3° 15) $\cos(6A + 5^\circ) = \frac{1}{\sec(4A + 15^\circ)}$ 5°

Identify the quadrant or quadrants for the angle satisfying the given conditions.

- 16) $\sin \theta > 0$, $\cos \theta < 0$ II 17) $\cos \theta > 0$, $\tan \theta > 0$ I
- 18) $\tan \theta > 0$, $\cot \theta > 0$ I or III 19) $\tan \theta < 0$, $\cot \theta < 0$ II or IV
- 20) $\cos \theta < 0$ II or III 21) $\tan \theta > 0$ I or III

Give the signs of the sine, cosine, and tangent functions for each angle. (Write + or - in the blanks.)

- 22) 74° $\sin \rightarrow$ + + -, $\cos \rightarrow$ - + -, $\tan \rightarrow$ - + - 23) 298° $\sin \rightarrow$ - - -, $\cos \rightarrow$ - + -, $\tan \rightarrow$ - - -
 24) 129° $\sin \rightarrow$ - + -, $\cos \rightarrow$ - - -, $\tan \rightarrow$ - - - 25) 183° $\sin \rightarrow$ - - -, $\cos \rightarrow$ - - -, $\tan \rightarrow$ - + -
 26) 406° $\sin \rightarrow$ - + -, $\cos \rightarrow$ - + -, $\tan \rightarrow$ - + - 27) 412° $\sin \rightarrow$ - + -, $\cos \rightarrow$ - + -, $\tan \rightarrow$ - + -
 28) -82° $\sin \rightarrow$ - - -, $\cos \rightarrow$ - + -, $\tan \rightarrow$ - - - 29) -121° $\sin \rightarrow$ - - -, $\cos \rightarrow$ - - -, $\tan \rightarrow$ - + -

Decide whether each statement is possible or impossible for an angle θ .

- 30) $\sin \theta = 2$ impossible 31) $\cos \theta = -1.001$ impossible 32) $\tan \theta = 0.92$ possible
 33) $\cot \theta = -12.1$ possible 34) $\sec \theta = 1$ possible 35) $\tan \theta = 1$ possible
 36) $\sin \theta = \frac{1}{2}$ and $\csc \theta = 2$ possible 37) $\tan \theta = 2$ and $\cot \theta = -2$ impossible

Use identities to find each function value.

- 38) $\tan \theta$, if $\sec \theta = 3$, with θ in quadrant IV
 $\tan \theta = -2\sqrt{2}$
 39) $\sin \theta$, if $\cos \theta = -\frac{1}{4}$, with θ in quadrant II
 $\sin \theta = \frac{\sqrt{15}}{4}$
 40) $\csc \theta$, if $\cot \theta = -\frac{1}{2}$, with θ in quadrant IV
 $\csc \theta = -\frac{\sqrt{5}}{2}$
 41) $\sec \theta$, if $\tan \theta = \frac{\sqrt{7}}{3}$, with θ in quadrant III
 $\sec \theta = -\frac{4}{3}$
 42) $\cos \theta$, if $\csc \theta = -4$, with θ in quadrant III
 $\cos \theta = -\frac{\sqrt{15}}{4}$
 43) $\sin \theta$, if $\sec \theta = 2$, with θ in quadrant IV
 $\sin \theta = -\frac{\sqrt{3}}{2}$

Find the values of the six trigonometric functions for each angle.

- 44) with θ in quadrant III 45) with θ in quadrant II 46) with θ in quadrant III
 $\sin \theta = -\frac{4}{5}$ $\sin \theta = \frac{15}{17}$ $\sin \theta = -\frac{\sqrt{3}}{2}$
 $\cos \theta = -\frac{3}{5}$ $\cos \theta = -\frac{8}{17}$ $\cos \theta = -\frac{1}{2}$
 $\tan \theta = \frac{4}{3}$ $\tan \theta = -\frac{15}{8}$ $\tan \theta = \sqrt{3}$
 $\csc \theta = -\frac{5}{4}$ $\csc \theta = \frac{17}{15}$ $\csc \theta = -\frac{2\sqrt{3}}{3}$
 $\sec \theta = -\frac{5}{3}$ $\sec \theta = -\frac{17}{8}$ $\sec \theta = -2$
 $\cot \theta = \frac{3}{4}$ $\cot \theta = -\frac{8}{15}$ $\cot \theta = \frac{\sqrt{3}}{3}$