
Suppose $\cos t = -\frac{\sqrt{3}}{2}$. Fill in the blanks below. Simplify all answers.

SCORE: _____ / 13 PTS

[a] The reference angle for t is $\frac{\pi}{6}$ radians.

[b] t could be in quadrant(s) $2, 3$.

[c] The possible value(s) of t is (are) $\frac{5\pi}{6}, \frac{7\pi}{6}$. **NOTE:** Your answer(s) must be between 0 and 2π .

Let $\theta = -\frac{26\pi}{6}$. Fill in the blanks below. Simplify all answers.

SCORE: ____ / 11 PTS

[a] The smallest positive angle coterminal with θ is $\frac{5\pi}{3}$ radians.

[b] The reference angle for θ is $\frac{\pi}{3}$ radians.

[c] $\tan \theta = \frac{-\sqrt{3}}{3}$.

[d] $\csc \theta = \frac{-2\sqrt{3}}{3}$.

Let θ be an angle such that $\sin \theta = -\frac{4\sqrt{2}}{9}$ and $\cos \theta = \frac{7}{9}$. Fill in the blanks below. Simplify all answers.

SCORE: ____ / 12 PTS

[a] $\sec \theta = \frac{9}{7}$.

[b] $\cot \theta = -\frac{7\sqrt{2}}{8}$.

[c] $\sec(-\theta) = \frac{9}{7}$.

[d] $\csc\left(\frac{\pi}{2} - \theta\right) = \frac{9}{7}$.

Suppose $\csc t = \frac{7}{3}$ and $\cos t < 0$. Fill in the blanks below. Simplify all answers.

SCORE: ____ / 10 PTS

[a] t is in quadrant 2.

[b] Find the value of $\cot t$ using identities, not triangles. **NOTE:** You must show the proper use of identities to get full credit.

$$\cot^2 t = \csc^2 t - 1$$

$$= \frac{49}{9} - 1$$

$$= \frac{40}{9} \longrightarrow \cot t = -\frac{2\sqrt{10}}{3}$$

Prove the identity $(3 \tan t + 2 \sec t)(3 \tan t - 2 \sec t) = 5 \tan^2 t - 4$.

SCORE: _____ / 10 PTS

↓

$$= 9 \tan^2 t - 4 \sec^2 t$$

$$= 9 \tan^2 t - 4(\tan^2 t + 1)$$

$$= 9 \tan^2 t - 4 \tan^2 t - 4 = 5 \tan^2 t - 4 \quad \text{QED}$$

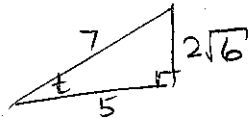
Let t be an acute angle such that $\sec t = \frac{7}{5}$. Fill in the blanks below. Simplify all answers.

SCORE: _____ / 8 PTS

[a] Draw a corresponding right angle triangle, and label the lengths of all sides.

[b] $\sin t = \frac{2\sqrt{6}}{7}$.

[c] $\cot t = \frac{5\sqrt{6}}{12}$.



Fill in the blanks.

SCORE: _____ / 6 PTS

[a] An angle of $\frac{34\pi}{9}$ radians has a reference angle of $\frac{2\pi}{9}$ radians. $3\frac{7}{9}\pi - 2\pi = 1\frac{7}{9}\pi$ IN Q_4

[b] $\csc(-31.1) = 3.2186$. Round your answer to 4 decimal places.

A vinyl record with a radius of 12 inches rotates at 33 revolutions per minute.

SCORE: ____ / 8 PTS

- [a] Find the angular speed of the record. State the units of your final answer. Round your answer to 2 decimal places.

$$\frac{33 \text{ REV}}{\text{MIN}} \cdot \frac{2\pi \text{ RAD}}{\text{REV}} = 66\pi \frac{\text{RAD}}{\text{MIN}} \approx 207.35 \text{ RAD/MIN}$$

- [b] Find the linear speed of a point on the outer edge of the record.
State the units of your final answer. Round your answer to 2 decimal places.

$$12 \text{ IN} \cdot \frac{66\pi \text{ RAD}}{\text{MIN}} = 792\pi \frac{\text{IN}}{\text{MIN}} \approx 2488.14 \text{ IN/MIN}$$

A sprinkler on a golf course fairway sprays water over a distance of 72 feet and rotates through an angle of 2.9 radians. Find the area of the fairway watered by the sprinkler. **SCORE: _____ / 4 PTS**

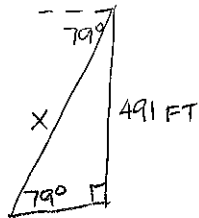
State the units of your final answer. Round your answer to 2 decimal places.

$$\frac{1}{2} (72 \text{ FT})^2 (2.9) = 7516.8 \text{ FT}^2$$

A surveyor is standing near the base of a 491 foot tall monument. If the angle of depression from the top of the monument to the surveyor is 79° , what is the distance from the surveyor to the top of the monument?

SCORE: ____ / 10 PTS

State the units of your final answer. Round your answer to 2 decimal places.



$$\sin 79^\circ = \frac{491 \text{ FT}}{x}$$

$$x = \frac{491 \text{ FT}}{\sin 79^\circ} \approx 500.19 \text{ FT}$$