

Name: _____

Show all work on the quiz in the space provided. Correct answers without work will not receive credit. There are to be no calculators used for this quiz.

1. Find the exact values of the 6 trig functions for θ if θ is an angle in the third quadrant with $\cos(\theta) = \frac{-\sqrt{85}}{11}$.

Since $\cos^2 \theta + \sin^2 \theta = 1$, we have

$$\left(\frac{-\sqrt{85}}{11}\right)^2 + \sin^2 \theta = 1$$

$$\frac{85}{121} + \sin^2 \theta = 1$$

$$\sin^2 \theta = 1 - \frac{85}{121} = \frac{36}{121}$$

$$\sin \theta = \pm \frac{6}{11}$$

As θ is in the third quadrant, $\sin \theta$ is negative and so $\sin \theta = \frac{-6}{11}$.

Then we have

$$\begin{aligned} \sin \theta &= \frac{-6}{11} & \sec \theta &= \frac{1}{\cos \theta} = \frac{1}{\frac{-\sqrt{85}}{11}} = \frac{-11}{\sqrt{85}} = \frac{11\sqrt{85}}{85} \\ \cos \theta &= \frac{-\sqrt{85}}{11} & \csc \theta &= \frac{1}{\sin \theta} = \frac{1}{\frac{-6}{11}} = \frac{-11}{6} \\ \tan \theta &= \frac{\sin \theta}{\cos \theta} = \frac{\frac{-6}{11}}{\frac{-\sqrt{85}}{11}} = \frac{6}{\sqrt{85}} = \frac{6\sqrt{85}}{85} & \cot \theta &= \frac{1}{\tan \theta} = \frac{1}{\frac{6\sqrt{85}}{85}} = \frac{85}{6\sqrt{85}} = \frac{\sqrt{85}}{6} \end{aligned}$$

2. Find the exact value of $\csc(-315^\circ)$ without using a calculator.

The reference angle for -315° is 45° and since -315° is in the first quadrant, $\csc(-315^\circ)$ is positive. Therefore

$$\csc(-315^\circ) = \csc(45^\circ) = \frac{1}{\sin(45^\circ)} = \frac{1}{\frac{\sqrt{2}}{2}} = \sqrt{2}$$