

Quiz 6
MTH 13 Section E01
27 April 2017

Your name:

Instructions: Please answer the following and be sure to show your work or support your answer. You are not allowed to use the textbook, workbook, or notes. You cannot talk to other students. You may use your calculator.

1. Verify the following trigonometric identity:

$$\frac{\csc x}{\tan x + \cot x} = \cos x$$

$$\begin{aligned} \text{LHS} &= \frac{\frac{1}{\sin x}}{\frac{\sin x}{\cos x} + \frac{\cos x}{\sin x}} = \frac{\sin x \cos x}{\sin x \cos x} = \frac{\cos x}{\sin^2 x + \cos^2 x} = \cos x = \text{RHS} \quad \checkmark \end{aligned}$$

2. Recall that $\sin 45^\circ = \frac{\sqrt{2}}{2} = \cos 45^\circ$, $\sin 30^\circ = \frac{1}{2}$, and $\cos 30^\circ = \frac{\sqrt{3}}{2}$. What is the exact value of $\sin 75^\circ$?

$$\begin{aligned} \sin 75^\circ &= \sin(45^\circ + 30^\circ) = \sin 45^\circ \cos 30^\circ + \cos 45^\circ \sin 30^\circ \\ &= \frac{\sqrt{2}}{2} \frac{\sqrt{3}}{2} + \frac{\sqrt{2}}{2} \frac{1}{2} \\ &= \frac{\sqrt{6} + \sqrt{2}}{4} \end{aligned}$$

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