Situation 29: Trigonometric Identities
Prepared at University of Georgia
Center for Proficiency in Teaching Mathematics
6/28/05 – Bob Allen

Prompt

(This may be too specific of a much broader proof example)

While proving trigonometric identities such as $\sin x \cdot \cos x \cdot \tan x = \dfrac{1}{\csc^2 x}$, a student's work is this:

$$\sin x \cdot \cos x \cdot \tan x = \frac{1}{\csc^2 x}$$

$$\csc^2 x \cdot \sin x \cdot \cos x \cdot \tan x = 1$$

$$\frac{1}{\sin^2 x} \cdot \sin x \cdot \cos x \cdot \frac{\sin x}{\cos x} = 1$$

$$\cos x \cdot \frac{1}{\cos x} = 1$$

$$1 = 1$$

Is this a proper proof of the trigonometric identity? If not, how would you explain to the student the mistake with the proof?

Commentary

Mathematical Foci

Mathematical Focus 1

Mathematical Focus 2

Mathematical Focus 3