



The Common Core State Standards for Mathematical Practice #2 states that students should learn to “reason abstractly and quantitatively”. In this module, participants will have the opportunity to engage with an instructional scenario drawn from the secondary algebra curriculum. Specifically, participants will observe, annotate, and read other participants’ annotations of a scenario in which students are working on finding the value of trigonometric functions. In the scenario, students attempt to exercise their ability to “decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved,” in an attempt to determine the appropriateness of the values they have calculated. After considering various ways the teacher could support SMP #2, participants will have the opportunity to try implementing the SMP with their own students and receive feedback from an online facilitator.

Identities

Reciprocals

$$\tan x = \frac{\sin x}{\cos x}$$
$$\csc x = \frac{1}{\sin x}$$
$$\sec x = \frac{1}{\cos x}$$
$$\cot x = \frac{1}{\tan x} = \frac{\cos x}{\sin x}$$

Pyth We can just substitute into the identities right?
 $1 + \cot^2 x = \csc^2 x$
 $\tan^2 x + 1 = \sec^2 x$

find the exact values of the remaining functions given:
 $\sin x = \frac{4}{5}$ $\cot x = -\frac{3}{4}$ $\csc x = \frac{5}{4}$
 $\tan x = \frac{4}{3}$

Why do we need to do that, I can come up with the values using my calculator

The image depicts a classroom scene with two cartoon characters, a blue one and a green one, sitting at a desk. The blue character is speaking, and the green character is responding. In the background, a whiteboard displays trigonometric identities and a problem. The identities listed are: $\tan x = \frac{\sin x}{\cos x}$, $\csc x = \frac{1}{\sin x}$, $\sec x = \frac{1}{\cos x}$, and $\cot x = \frac{1}{\tan x} = \frac{\cos x}{\sin x}$. The problem asks to find the exact values of the remaining functions given $\sin x = \frac{4}{5}$ and $\cot x = -\frac{3}{4}$. The solutions shown are $\csc x = \frac{5}{4}$ and $\tan x = \frac{4}{3}$. A speech bubble from the blue character says, "Pyth We can just substitute into the identities right?" with the identities $1 + \cot^2 x = \csc^2 x$ and $\tan^2 x + 1 = \sec^2 x$ written below. Another speech bubble from the green character says, "Why do we need to do that, I can come up with the values using my calculator".