Trigonometry 2.1 - Fundamental Identities

* You will recognize and write the fundamental identities.
* Use the fundamental identities to evaluate, simplify and rewrite trigonometric expressions.

Terminology

Expression

Identity
Identities we already know:

Reciprocal identities

Quotient identities

Pythagorean identities

Cofunction identities

Examples of using identities:

a. To solve a problem:
   sec u = -5/4 and tan u > 0. Find sin u.

b. To simplify an expression:
   \[
   \frac{1}{\tan^2 x + 1}
   \]
c. Simplify  \( \cos t (1 + \tan^2 t) \)

d. Use algebra on trigonometric expressions
   Factor:  \( \sin^2 x \sec^2 x - \sin^2 x = \)

e. Simplify:  \( \frac{\cos^2 x - 4}{\cos x - 2} \)

f. Multiply:  \( (3 - \sin x) (3 + \sin x) \)
Try these:

a. Simplify: \( \frac{\cot^2 x}{\csc^2 x} \)

b. Simplify: \( \tan x - \frac{\sec^2 x}{\tan x} \)

c. Simplify: \( \frac{\tan^2 x}{\sec x + 1} \)