

Section 5.1 (Day 1) – Practice with Identities!

Recall: the first few identities we learned:

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

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

$$\tan x = \frac{\sin x}{\cos x} \quad \cot x = \frac{\cos x}{\sin x}$$

$$\sin^2 x + \cos^2 x = 1 \quad 1 + \tan^2 x = \sec^2 x \quad 1 + \cot^2 x = \csc^2 x$$

First, we are going to use them in a way that should feel familiar – use one trig function to find all six!

Example: Let $\sec x = \frac{-3}{2}$ and $\tan x = \frac{\sqrt{5}}{2}$ to find the values of all six trig functions:

(in this one you are using the reciprocal identities)

Now we are going to use them to **simplify** expressions:

a) $\sin x + \cot x \cos x$

Section 5.1 (Day 1) – Practice with Identities!

b) $\frac{\sin \vartheta}{1 + \cos \vartheta} + \frac{\cos \vartheta}{\sin \vartheta}$

We can also use them to change rather than simplify:

c) Rewrite $\frac{1}{1 + \sin x}$ so it is NOT in fractional form

Section 5.1 (Day 1) – Practice with Identities!

Factoring

a) $\sec^2 \theta - 1$

b) $\sin x \cos^2 x - \sin x$

c) $4 \tan^2 \beta + \tan \beta - 3$

d) $\csc^2 x - \cot x - 3$

e) $\tan^2 x - \tan^2 x \sin^2 x$

Homework: p. 379 #1, 5, 6, 10, 15-18, 27-32