

Section 5.1 (Day 2) – Practice with Identities!

A few more identities to know

Cofunction Identities:

$$\sin\left(\frac{\pi}{2}-x\right)=\cos x \quad \sec\left(\frac{\pi}{2}-x\right)=\csc x \quad \tan\left(\frac{\pi}{2}-x\right)=\cot x$$

$$\cos\left(\frac{\pi}{2}-x\right)=\sin x \quad \csc\left(\frac{\pi}{2}-x\right)=\sec x \quad \cot\left(\frac{\pi}{2}-x\right)=\tan x$$

Odd and Even Identities:

$$\sin(-x)=-\sin x \quad \cos(-x)=\cos x \quad \tan(-x)=-\tan x$$

$$\csc(-x)=-\csc x \quad \sec(-x)=\sec x \quad \cot(-x)=-\cot x$$

Let's do some more examples WITH THE NEW IDENTITIES:

Simplify (to one trig function):

a) $\frac{\sin(-x)}{\cos(-x)}$

b) $\frac{\sin\left(\frac{\pi}{2}-z\right)}{\cos\left(\frac{\pi}{2}-z\right)}$

c) $\frac{1-\sin^2(-x)}{\csc^2(-x)-1}$

d) $\cos\left(\frac{\pi}{2}-x\right)\sec x$

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Back to the other kind:

a) $\cos^2 \beta (1 + \tan^2 \beta)$

b) $(2\csc x + 2)(2\csc x - 2)$

Sometimes it is not one trig function at the end – it is just a simpler combined expression:

a) *Add* $\frac{1}{1 + \cos x} + \frac{1}{1 - \cos x}$

b) *Subtract* $\tan x - \frac{\sec^2 x}{\tan x}$

c) *factor:* $\tan^4 x + 2\tan^2 x + 1$

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Write *without* a fraction:

a) $\frac{\sin^2 y}{1 - \cos y}$

b) $\frac{\cos^2 y}{1 - \sin y}$

HW: p.379 # 19, 20, 33-41, 48, 49, 53, 56, 58, 63