

## 5.1 Using Fundamental Identities

Reciprocal Identities

Quotient Identities

Pythagorean Identities

Simplifying Trig Expressions

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### Reciprocal Identities

$$\sin \theta = \frac{1}{\csc \theta}$$

$$\cos \theta = \frac{1}{\sec \theta}$$

$$\tan \theta = \frac{1}{\cot \theta}$$

$$\csc \theta = \frac{1}{\sin \theta}$$

$$\sec \theta = \frac{1}{\cos \theta}$$

$$\cot \theta = \frac{1}{\tan \theta}$$

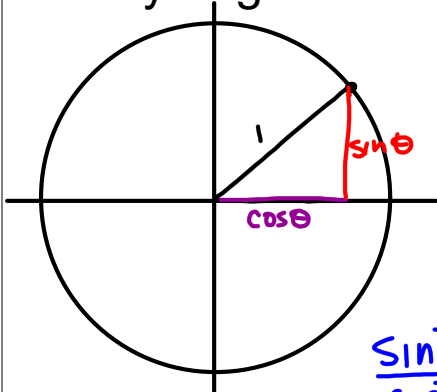
### Quotient Identities

$$\tan \theta = \frac{\sin \theta}{\cos \theta}$$

$$\cot \theta = \frac{\cos \theta}{\sin \theta}$$

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## Pythagorean Identities



$$\sin^2 \theta + \cos^2 \theta = 1$$

$$\sin^2 \theta = 1 - \cos^2 \theta$$

$$\cos^2 \theta = 1 - \sin^2 \theta$$

$$\cos^2 \theta - 1 = -\sin^2 \theta$$

$$\sin^2 \theta - 1 = -\cos^2 \theta$$

$$\frac{\sin^2 \theta + \cos^2 \theta}{\cos^2 \theta} = \frac{1}{\cos^2 \theta}$$

$$\tan^2 \theta + 1 = \sec^2 \theta$$

$$\sec^2 \theta = \tan^2 \theta + 1$$

$$\sec^2 \theta - \tan^2 \theta = 1$$

$$\sec^2 \theta - 1 = \tan^2 \theta$$

$$\frac{\sin^2 \theta + \cos^2 \theta}{\sin^2 \theta} = \frac{1}{\sin^2 \theta}$$

$$1 + \cot^2 \theta = \csc^2 \theta$$

$$1 + \cot^2 \theta = \csc^2 \theta$$

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## Simplifying by Factoring GCF

$$\cos^2 x \csc x - \csc x$$

$$\csc x (\cos^2 x - 1)$$

$$\csc x (-\sin^2 x)$$

$$\frac{1}{\cancel{\sin x}} \left( -\frac{\sin^2 x}{1} \right)$$

$$-\sin x$$

$$\sin^2 x + \cos^2 x = 1$$

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5.1 part 1.notebook

### Simplify by factoring

$$1 - \cos^2 x$$

$\sin^2 x$

$$(1 - \cos x)(1 + \cos x)$$

$$2 \csc^2 x - 7 \csc x + 6$$

$r = \csc x$

$$2r^2 - 7r + 6$$

12  
-7  
-3, -4

$$2r^2 - 3r - 4r + 6$$

$$r(2r-3) - 2(2r-3)$$

$$(r-2)(2r-3)$$

$$(\csc x - 2)(2 \csc x - 3)$$

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### Simplifying with Substitution and Factoring

$$\sec^2 x + 3 \tan x + 1$$

$\tan^2 x + 1 + 3 \tan x + 1$

$$\tan^2 x + 3 \tan x + 2$$

$$(\tan x + 2)(\tan x + 1)$$

$$\sec^2 x = \tan^2 x + 1$$

$$\sqrt{x^2 + 1} \neq x + 1$$

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## 5.1 part 1.notebook

### Simplifying Using Reciprocals

$$\csc x - \cos x \cot x$$

$$\frac{1}{\sin x} - \frac{\cos x}{1} \left( \frac{\cos x}{\sin x} \right)$$

$$\frac{1}{\sin x} - \frac{\cos^2 x}{\sin x}$$

$$\frac{1 - \cos^2 x}{\sin x}$$

$$\frac{\sin^2 x}{\sin x}$$

$$\sin x$$

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### Simplifying Sums

$$\frac{1}{1 + \sin \theta} + \frac{1}{1 - \sin \theta}$$

$$\frac{(1 - \cancel{\sin \theta}) + (1 + \cancel{\sin \theta})}{(1 + \sin \theta)(1 - \sin \theta)}$$

$$\frac{2}{1 - \cancel{\sin \theta} + \cancel{\sin \theta} - \sin^2 \theta}$$

$$\frac{2}{1 - \sin^2 \theta}$$

$$\frac{2}{\cos^2 \theta}$$

$$2 \sec^2 \theta$$

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# HOMEWORK



p 379 13-35 odd, 41-59 odd

DUE NEXT TUESDAY

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Feb 14-7:07 AM