Trigonometric Identities

Learning Goal: By the end of today, I will be able to use the Pythagorean and quotient trigonometric identities to simplify algebraic expressions.

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Prove the following is true or false:

$$(8+2)^2 - 4(5) = (4)^2(5)$$

LS =   RS =

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Prove the following is true or false:

$$(x+2)^2 - 1 = (x+1)(x+3)$$

LS =   RS =

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To prove a trigonometric statement is true or
false, we need a few more tools; trigonometric
identities will be those tools. Identities are
known relationships that are always true and
can be used to simplify a complex expression
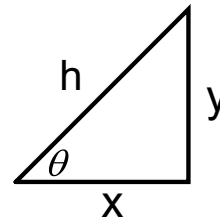to a simplified expression.

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Quotient Identity

Isolate x or y

$\sin\theta =$

$\cos\theta =$

h $\diagup$ y

θ

x

- →

$\tan\theta =$

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

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Pythagorean Identity

$\sin\theta =$

$$x^2 + y^2 = h^2$$

Divide by h²

$\cos\theta =$

h $\diagup$ y

θ

x

$\tan\theta =$

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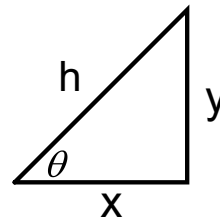
$$\sin^2\theta + \cos^2\theta = 1$$

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Prove the following:

$$\tan\theta\cos\theta = \sin\theta$$

Ls =   Rs =

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Prove the following:

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

Ls =   Rs =

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Prove the following:

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

Ls =   Rs =

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Identity Strategies

1. convert Tan using quotient identity

2. look for squared terms (Pythagorean identity)

3. compare the number of TERMS

4. compare the denominators

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Homework

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