Proving trigonometric identities essay sample

Science

When listening to Mr. Burger on how to prove trig identities he stated that you mightwant to work with both sides and come to common end statement. I think of proving trigidentities the same way you did proofs in geometry. You typically want to work with oneside, massage it, and hopefully you will create the expression on the other side of theequal sign. These types of problems should be viewed as ‘ given a problem and itsanswer, how do you get to the answer?’. You want to keep in mind all of the trigidentities you have been exposed to thus far to assist you in proving trig identities. Example

Prove: 1tantan1cot

θ θ θ

+=+

By examining both sides of the equal sides, it appears that you want to begin with the leftside in order to create the right side. sin11tancoscos1cot1sin θ θ

θ θ θ θ

++=++

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θ θ θ θ θ θ θ θ

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θ θ θ θ θ θ

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θ θ θ θ θ θ

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θ θ θ θ θ θ

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= sintancos

θ θ θ

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The reason why it was best to convert in terms of sine and cosine is because the resultanttan θ is a trig function that can be expressed that way. There will be times when you willhave to begin with the right side of the equal sign and work your way to create the leftside of the equal sign.

Try the following:

Prove. 1.

1cossintancos

x x x

− =

2.

cottanseccsc

α α α α

+ =

3.

2222

sectan122sin2cos

θ θ θ θ

−=+

Answers:

2

11coscoscoscoscos

x x x x x

− = −

=

2

1coscos

−

=

2

sincos

x

= sinsinsinsintansinsintancoscos

x x x x x x x x x x

= = =

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cossinsincossincos

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22

cossin111cscsecsincossincossincos

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222222

sectan12sin2cos2sincos

θ θ θ θ θ θ

−=++

= 112(1)2