

WebAssign

MAT 10 HW 7.1 (Homework)

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 MAT 10 - Mulari, Spring 2014
 Instructor: Jeffrey Mulari

Current Score : 19 / 50

Due : Tuesday, May 6 2014 11:59 PM PDT

1. 5/5 points | [Previous Answers](#)

SPreCalc6 7.1.041.

Verify the identity.

$$\frac{\sin^2 x - \cos^2 x}{(\sin x - \cos x)^2} = \frac{(\sin x + \cos x)^2}{\sin^2 x - \cos^2 x}$$

Factor the denominator, and then simplify.

$$\begin{aligned} \frac{\sin^2 x - \cos^2 x}{(\sin x - \cos x)^2} &= \frac{(\sin x - \cos x)(\sin x + \cos x)}{(\sin x - \cos x) \left(\frac{\sin x + \cos x}{\sin x + \cos x} \right)} \\ &= \end{aligned}$$

Multiply the numerator and denominator by a common value to obtain the desired expression.

$$\begin{aligned} &= \left(\frac{\sin x + \cos x}{\sin x + \cos x} \right) \left(\frac{\sin x + \cos x}{\sin x + \cos x} \right) \\ &= \end{aligned}$$

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2. 3/3 points | [Previous Answers](#)

SPreCalc6 7.1.045.

Verify the identity.

$$\frac{1}{1 - \sin^2 y} = \tan^2 y + 1$$

Use a Pythagorean Identity in the denominator, and then use a Reciprocal Identity.

$$\frac{1}{1 - \sin^2 y} = \frac{1}{}$$



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Use a Pythagorean Identity.

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3. 3/3 points | [Previous Answers](#)

SPreCalc6 7.1.049.

Verify the identity.

$$(1 - \cos^2 x)(1 + \cot^2 x) = 1$$

Use the Pythagorean and Reciprocal Identities, and then simplify.

$$(1 - \cos^2 x)(1 + \cot^2 x) = \left(\right) \left(\csc^2 x \right)$$



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



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4. 4/4 points | [Previous Answers](#)

SPreCalc6 7.1.053.

Verify the identity.

$$\frac{1 - \cos \alpha}{\sin \alpha} = \frac{\sin \alpha}{1 + \cos \alpha}$$

Multiply the numerator and denominator by a common value, and then simplify.

$$\frac{1 - \cos \alpha}{\sin \alpha} = \left(\frac{1 - \cos \alpha}{\sin \alpha} \right) \left(\frac{1 + \cos \alpha}{1 + \cos \alpha} \right)$$

$$= \frac{(\sin \alpha)(1 + \cos \alpha)}{(\sin \alpha)(1 + \cos \alpha)}$$

Use a Pythagorean Identity, and then simplify.

$$= \frac{1}{1}$$

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5. 3/3 points | [Previous Answers](#)

SPreCalc6 7.1.057.

Verify the identity.

$$\frac{\sin x + 1}{\sin x - 1} = \frac{-\cos^2 x}{(\sin x - 1)^2}$$

Multiply the numerator and denominator by a common value, and then simplify.

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

$$= \frac{(\sin x + 1)(\sin x - 1)}{(\sin x - 1)^2}$$

Use a Pythagorean Identity.

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6. 1/5 points | [Previous Answers](#)

SPreCalc6 7.1.061.

Verify the identity.

$$9 \left(\frac{1 + \cot^2 u}{1 - \cot^2 u} \right) = \frac{9}{\sin^2 u - \cos^2 u}$$

Use a Reciprocal Identity, and simplify the compound fraction by multiplying by a common factor.

$$\begin{aligned}
 9 \left(\frac{1 + \cot^2 u}{1 - \cot^2 u} \right) &= \frac{9 \left(1 + \frac{\cancel{\sin^2 u}}{\cancel{\sin^2 u}} \right)}{1 - \frac{\cos^2 u}{\sin^2 u}} \\
 &= \frac{9 \left(1 + \frac{}{\sin^2 u} \right) (\sin^2 u)}{\left(1 - \frac{\cos^2 u}{\sin^2 u} \right) (\sin^2 u)} \\
 &= \frac{9 (\sin^2 u + \cos^2 u)}{\sin^2 u - \cos^2 u}
 \end{aligned}$$

Use a Pythagorean Identity.

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7. -/4 points

SPreCalc6 7.1.063.

Verify the identity.

$$\frac{8 \csc x}{\csc x - \cot x} = 8 \csc x (\csc x + \cot x)$$

Multiply the numerator and denominator by a common value, and then simplify.

$$\begin{aligned} \frac{8 \csc x}{\csc x - \cot x} &= \left(\frac{8 \csc x}{\csc x - \cot x} \right) \left(\frac{\csc x + \cot x}{\csc x + \cot x} \right) \\ &= \frac{8 \csc x (\csc x + \cot x)}{\csc^2 x - \cot^2 x} \end{aligned}$$

Use a Pythagorean Identity, and then simplify.

$$\begin{aligned} &= \frac{8 \csc x}{1} \\ &= 8 \csc x \end{aligned}$$

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8. -/4 points

SPreCalc6 7.1.067.

Verify the identity.

$$\frac{\cos x + \sin x}{\sec x + \csc x} = \cos x \sin x$$

Use the Reciprocal Identities, and simplify the compound fraction.

$$\begin{aligned} \frac{\cos x + \sin x}{\sec x + \csc x} &= \frac{\cos x + \sin x}{\left(\frac{1}{\cos x} + \frac{1}{\sin x} \right)} \\ &= \frac{\cos x + \sin x}{\frac{\cos x \sin x}{\cos x \sin x}} \\ &= (\cos x + \sin x) \left(\frac{\cos x \sin x}{\cos x + \sin x} \right) \\ &= \end{aligned}$$

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9. -/3 points

SPreCalc6 7.1.071.

Verify the identity.

$$\tan^2 u - \sin^2 u = \tan^2 u \sin^2 u$$

Use the Reciprocal Identities, and combine the terms as a single rational expression.

$$\begin{aligned} \tan^2 u - \sin^2 u &= \frac{\sin^2 u}{\cos^2 u} - \sin^2 u \left(\frac{\quad}{\cos^2 u} \right) \\ &= \frac{\sin^2 u \left(\frac{\quad}{\cos^2 u} \right)}{\cos^2 u} \end{aligned}$$

Use the Reciprocal and Pythagorean Identities.

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