

Question

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**Description**

This homework assignment covers Chapter 7: 7.1, 7.2, 7.3... Please work as many problems as possible and turn in your work by the due date. Late homework is NOT accepted. As always, if you need anything, please email me  
Joshua.Patterson@tamuc.edu

1. Question Details SPreCalc6 7.1.001. [1719016]

An equation is called an identity if it is valid for  value(s) of the variable. The equation  $2x = x + x$  is an algebraic identity, and the equation  $\sin^2 x + \cos^2 x = \square$  is a trigonometric identity.

2. Question Details SPreCalc6 7.1.003. [2703771]

Write the trigonometric expression in terms of sine and cosine, and then simplify.

$$4 \cos t \tan t$$

3. Question Details SPreCalc6 7.1.004. [2703858]

Write the trigonometric expression in terms of sine and cosine, and then simplify.

$$\cos t \csc t$$

4. Question Details SPreCalc6 7.1.008.MI. [2678482]

Write the trigonometric expression in terms of sine and cosine, and then simplify.

$$\frac{\sec x}{\csc x}$$

5. Question Details SPreCalc6 7.1.009. [2703875]

Write the trigonometric expression in terms of sine and cosine, and then simplify.

$$\cos u \cot u + \sin u$$

6. Question Details SPreCalc6 7.1.010. [2705111]

Write the trigonometric expression in terms of sine and cosine, and then simplify.

$$\sin^2 \theta (1 + \cot^2 \theta)$$

7. Question Details SPreCalc6 7.1.011. [2703846]

Write the trigonometric expression in terms of sine and cosine, and then simplify.

$$\frac{\cos \theta - \sec \theta}{\sin \theta}$$

Factor the expression and use the fundamental identities to simplify. There is more than one correct form of the answer.

$$3 \sin^2 x \csc^2 x - 3 \sin^2 x$$

Simplify the trigonometric expression.

$$\frac{2 \sin x \sec x}{\tan x}$$

Simplify the trigonometric expression.

$$\frac{1 + \cos y}{\sec y + 1}$$

Simplify the trigonometric expression.

$$\frac{\csc^2 x - 1}{\csc^2 x}$$

Verify the identity.

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

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

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

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

Use a Pythagorean Identity.

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Verify the identity.

$$\frac{\cos w}{\cos w + \sin w} = \frac{\cot w}{1 + \cot w}$$

Verify the identity.

$$\frac{1 + \sec^2 x}{1 + \tan^2 x} = \cos^2 x + 1$$

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Verify the identity.

$$\frac{\cos A}{1 - \sin A} - \tan A = \sec A$$

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Verify the identity.

$$\frac{\sin^2 t + \cot^2 t - 1}{\cos^2 t} = \cot^2 t$$

Use the Pythagorean and Reciprocal Identities to simplify.

$$\begin{aligned} \frac{\sin^2 t + \cot^2 t - 1}{\cos^2 t} &= \frac{\quad + \cot^2 t}{\cos^2 t} \\ &= \left( \frac{1}{\cos^2 t} \right) + \left( \frac{\cos^2 t}{\sin^2 t} \right) \left( \frac{1}{\cos^2 t} \right) \\ &= \quad + \left( \frac{1}{\sin^2 t} \right) \\ &= \quad + \csc^2 t \\ &= \end{aligned}$$

Verify the identity.

$$\frac{1 + \cot x}{1 - \cot x} = \frac{\tan x + 1}{\tan x - 1}$$

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Use an Addition or Subtraction Formula to find the exact value of the expression, as demonstrated in [Example 1](#).

$$\sin 75^\circ$$

19. Question Details

SPreCalc6 7.2.006. [2708244]

Use an Addition or Subtraction Formula to find the exact value of the expression, as demonstrated in [Example 1](#).

$$\cos 75^\circ$$

20. Question Details

SPreCalc6 7.2.007. [2708334]

Use an Addition or Subtraction Formula to find the exact value of the expression, as demonstrated in [Example 1](#).

$$\tan 75^\circ$$

21. Question Details

SPreCalc6 7.2.012.MI. [2678435]

Use an Addition or Subtraction Formula to find the exact value of the expression, as demonstrated in Example 1.

$$\sin\left(-\frac{5\pi}{12}\right)$$

22. Question Details

SPreCalc6 7.2.015. [2708250]

Use an Addition or Subtraction Formula to write the expression as a trigonometric function of one number.

$$\cos 19^\circ \cos 26^\circ - \sin 19^\circ \sin 26^\circ$$

Find its exact value.

23. Question Details

SPreCalc6 7.2.016.MI. [2725681]

Use an Addition or Subtraction Formula to write the expression as a trigonometric function of one number.

$$\cos 15^\circ \cos 75^\circ - \sin 15^\circ \sin 75^\circ$$

Find its exact value.

24. Question Details

SPreCalc6 7.2.017. [2708345]

Use an Addition or Subtraction Formula to write the expression as a trigonometric function of one number.

$$\cos \frac{4\pi}{5} \cos \frac{7\pi}{15} + \sin \frac{4\pi}{5} \sin \frac{7\pi}{15}$$

Find its exact value.

Use an Addition or Subtraction Formula to write the expression as a trigonometric function of one number.

$$\frac{\tan 41^\circ - \tan 11^\circ}{1 + \tan 41^\circ \tan 11^\circ}$$

Find its exact value.

Use an Addition or Subtraction Formula to write the expression as a trigonometric function of one number.

$$\cos \frac{13\pi}{15} \cos \left(-\frac{\pi}{5}\right) - \sin \frac{13\pi}{15} \sin \left(-\frac{\pi}{5}\right)$$

Find its exact value.

Prove the identity.

$$\tan \left(x - \frac{\pi}{4}\right) = \frac{\tan x - 1}{\tan x + 1}$$

Prove the identity.

$$3 \cos(x + y) + 3 \cos(x - y) = 6 \cos x \cos y$$

Prove the identity.

$$\cot(x + y) = \frac{\cot y \cot x - 1}{\cot x + \cot y}$$

30. Question Details

SPreCalc6 7.3.001. [2708790]

If we know the values of  $\sin x$  and  $\cos x$ , we can find the value of  $\sin 2x$  by using the ---Select--- Formula for Sine.

State the formula:  $\sin 2x =$  \_\_\_\_\_ .

31. Question Details

SPreCalc6 7.3.002. [2708389]

If we know the value of  $\cos x$  and the quadrant in which  $x/2$  lies, we can find the value of  $\sin(x/2)$  by using the ---Select--- Formula for Sine.

State the formula:  $\sin(x/2) = \pm$  \_\_\_\_\_ .

32. Question Details

SPreCalc6 7.3.004. [2708211]

Find  $\sin 2x$ ,  $\cos 2x$ , and  $\tan 2x$  from the given information.

$$\tan x = -\frac{12}{5}, \quad x \text{ in Quadrant II}$$

$\sin 2x =$  \_\_\_\_\_

$\cos 2x =$  \_\_\_\_\_

$\tan 2x =$  \_\_\_\_\_

33. Question Details

SPreCalc6 7.3.006.MI. [2678458]

Find  $\sin 2x$ ,  $\cos 2x$ , and  $\tan 2x$  from the given information.

$$\csc x = 6, \quad \tan x < 0$$

$\sin 2x =$  \_\_\_\_\_

$\cos 2x =$  \_\_\_\_\_

$\tan 2x =$  \_\_\_\_\_

34. Question Details

SPreCalc6 7.3.008. [2708231]

Find  $\sin 2x$ ,  $\cos 2x$ , and  $\tan 2x$  from the given information.

$$\sec x = 8, \quad x \text{ in Quadrant IV}$$

$\sin 2x =$  \_\_\_\_\_

$\cos 2x =$  \_\_\_\_\_

$\tan 2x =$  \_\_\_\_\_

35. Question Details

SPreCalc6 7.3.009. [2708228]

Find  $\sin 2x$ ,  $\cos 2x$ , and  $\tan 2x$  from the given information.

$$\tan x = -\frac{1}{2}, \quad \cos x > 0$$

$\sin 2x =$  \_\_\_\_\_

$\cos 2x =$  \_\_\_\_\_

$\tan 2x =$  \_\_\_\_\_

36. Question Details SPreCalc6 7.3.017. [2709806]

Use an appropriate Half-Angle Formula to find the exact value of the expression.

$$\sin 15^\circ$$

37. Question Details SPreCalc6 7.3.018. [2709884]

Use an appropriate Half-Angle Formula to find the exact value of the expression.

$$\tan 15^\circ$$

38. Question Details SPreCalc6 7.3.019. [2709011]

Use an appropriate Half-Angle Formula to find the exact value of the expression.

$$\tan 22.5^\circ$$

39. Question Details SPreCalc6 7.3.020.MI. [2708969]

Use an appropriate Half-Angle Formula to find the exact value of the expression.

$$\sin 75^\circ$$

40. Question Details SPreCalc6 7.3.021. [2709729]

Use an appropriate Half-Angle Formula to find the exact value of the expression.

$$\cos 165^\circ$$

41. Question Details SPreCalc6 7.3.025. [2709702]

Use an appropriate Half-Angle Formula to find the exact value of the expression.

$$\sin \frac{\pi}{8}$$

42. Question Details SPreCalc6 7.3.029. [2709809]

Simplify the expression by using a Double-Angle Formula or a Half-Angle Formula.

(a)  $2 \sin 17^\circ \cos 17^\circ$

(b)  $2 \sin 4\theta \cos 4\theta$

Simplify the expression by using a Double-Angle Formula or a Half-Angle Formula.

(a)  $\frac{2 \tan 9^\circ}{1 - \tan^2 9^\circ}$

(b)  $\frac{2 \tan 9\theta}{1 - \tan^2 9\theta}$

Simplify the expression by using a Double-Angle Formula or a Half-Angle Formula.

(a)  $\cos^2 35^\circ - \sin^2 35^\circ$

(b)  $\cos^2 4\theta - \sin^2 4\theta$

Simplify the expression by using a Double-Angle Formula or a Half-Angle Formula.

(a)  $\cos^2 \frac{\theta}{2} - \sin^2 \frac{\theta}{2}$

(b)  $2 \sin \frac{\theta}{2} \cos \frac{\theta}{2}$

Simplify the expression by using a Double-Angle Formula or a Half-Angle Formula.

(a)  $\frac{\sin 6^\circ}{1 + \cos 6^\circ}$

(b)  $\frac{1 - \cos 6\theta}{\sin 6\theta}$