GO COUGARS!

p 365 **Homework Questions**

In Exercises 1–10, verify the identity.

1. $\sin t \csc t = 1$
2. $\sec y \cos y = 1$
3. $\frac{\csc^2 x}{\cot x} = \csc x \sec x$
4. $\frac{\sin^2 t}{\tan^2 t} = \cos^2 t$
5. $\cos^2 \beta - \sin^2 \beta = 1 - 2\sin^2 \beta$
6. $\cos^2 \beta - \sin^2 \beta = 2\cos^2 \beta - 1$
7. $\tan^2 \theta + 6 = \sec^2 \theta + 5$
8. $2 - \csc^2 z = 1 - \cot^2 z$
9. $(1 + \sin x)(1 - \sin x) = \cos^2 x$
10. $\tan^2 y(\csc^2 y - 1) = 1$

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

In Exercises 39–50, verify the identity algebraically. Use a graphing utility to check your result graphically.

39. $2\sec^2 x - 2\sec^2 x \sin^2 x - \sin^2 x - \cos^2 x = 1$
41. $\frac{\cot x \tan x}{\sin x} = \csc x$
42. $\frac{1 + \csc \theta}{\sec \theta} - \cot \theta = \cos \theta$
43. $\csc^4 x - 2\csc^2 x + 1 = \cot^4 x$
44. $\sin x(1 - 2\cos^2 x + \cos^4 x) = \sin^5 x$
45. $\sec^4 \theta - \tan^4 \theta = 1 + 2\tan^2 \theta$
46. $\csc^4 \theta - \cot^4 \theta = 2\csc^2 \theta - 1$
47. $\frac{\sin \beta}{1 - \cos \beta} = \frac{1 + \cos \beta}{\sin \beta}$
48. $\frac{\cot \alpha}{\csc \alpha - 1} = \frac{\csc \alpha + 1}{\cot \alpha}$

$-(\cancel{\sin^2 x + \cos^2 x})$ 1
$2\sec^2 x(1 - \sin^2 x)$
$2\sec^2 x(\cos^2 x)$
2

$\frac{\csc^2 x}{\cot x}$
$\csc^2 x \tan x$
$\frac{1}{\sin^2 x} \cdot \frac{\sin x}{\cos x}$
$\frac{1}{\sin x} \cdot \frac{1}{\cos x}$
$\csc x \sec x$

$\sec^4 \theta - \tan^4 \theta = 1 + 2\tan^2 \theta$
$x^4 - y^4$
$(x^2 + y^2)(x^2 - y^2)$
$(\sec^2 \theta + \tan^2 \theta)(\cancel{\sec^2 \theta - \tan^2 \theta})$ 1
$\tan^2 \theta + 1 + \tan^2 \theta$
$2\tan^2 \theta + 1$

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

$\csc^4 x - 2\csc^2 x + 1 = \cot^4 x$
$a^4 - 2a^2 + 1$
$(a^2 - 1)(a^2 - 1)$
$(\csc^2 x - 1)(\csc^2 x - 1)$
$\cot^2 x \quad \cot^2 x$
$\cot^4 x$

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

$\frac{\csc a + 1}{\csc a + 1} \cdot \frac{\cot a}{\csc a - 1} = \frac{\csc a + 1}{\cot a}$
$\frac{(\csc a + 1)\cot a}{\csc^2 a - 1}$
$\frac{(\csc a + 1)\cancel{\cot a}}{\cot^2 a}$
✓ $\frac{\csc a + 1}{\cot a}$

Feb 2-9:51 PM

5.3 Solving Trig Equations

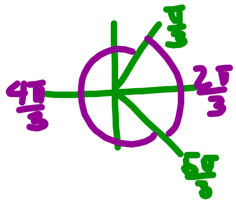
Feb 26-6:49 AM

When solving the domain may be [0, 2π) or (-∞, ∞).

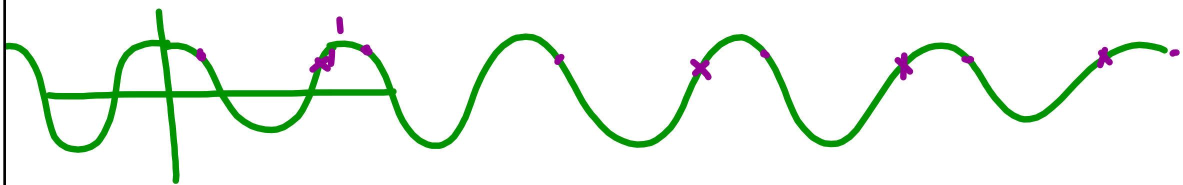
1. $\cos x = \frac{1}{2}$

RA $\frac{\pi}{3}$ Q 1,4

$x = \frac{\pi}{3}, \frac{5\pi}{3}$ [0, 2π)



$x = \frac{\pi}{3} + 2k\pi, \frac{5\pi}{3} + 2k\pi$
(-∞, ∞)

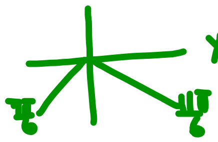


2. $\frac{2\sin x}{2} = \frac{-1}{2}$

$\sin x = -\frac{1}{2}$

RA $\frac{\pi}{6}$ Q 3,4

$x = \frac{7\pi}{6}, \frac{11\pi}{6}$ [0, 2π)



$x = \frac{7\pi}{6} + 2k\pi$
$\frac{11\pi}{6} + 2k\pi$

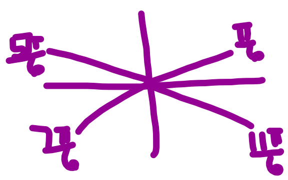
3. $4\sin^2 x - 1 = 0$

$\sqrt{\sin^2 x} = \sqrt{\frac{1}{4}}$

$\sin x = \pm \frac{1}{2}$

RA = $\frac{\pi}{6}$ all quads

$x = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$ [0, 2π)



$x = \frac{\pi}{6} + k\pi, \frac{5\pi}{6} + k\pi$

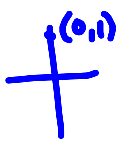
4. $\underbrace{\tan x}_{GCF} \sin x - \underbrace{\tan x}_{GCF} = 0$

$\tan x (\sin x - 1) = 0$

$\tan x = 0$	$\sin x = 1$
$\frac{\sin x}{\cos x} = 0$	$\cancel{x = \frac{\pi}{2}}$

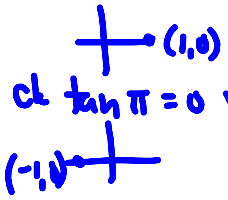
$x = 0, \pi$ ✓

ck $\tan \frac{\pi}{2}$ und



ck $\tan 0 = 0$ ✓

ck $\tan \pi = 0$ ✓



$x = 0, \pi$ [0, 2π)

$x = 0 + k\pi$
$x = k\pi$

5. $2\cos^2 x + \cos x - 1 = 0$

$2a^2 + a - 1$

$(2a-1)(a+1)$

$(2\cos x - 1)(\cos x + 1) = 0$

$\cos x = \frac{1}{2}$	$\cos x = -1$
RA $\frac{\pi}{3}$ 1,4	$x = \pi$
$x = \frac{\pi}{3}, \frac{5\pi}{3}$	

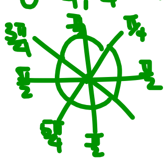
$x = \frac{\pi}{3}, \frac{5\pi}{3}, \pi$ $[0, 2\pi)$

$x = \frac{\pi}{3} + 2k\pi + \frac{5\pi}{3} + 2k\pi, \pi + 2k\pi$

$(-\infty, \infty)$

$\tan\theta = \pm 1$

$\theta = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$



$x = \frac{\pi}{4} + \frac{k\pi}{2}$

6. $(\tan^2 x) + \sec x - 1 = 0$

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

$(\sec^2 x - 1) + \sec x - 1 = 0$

$\sec^2 x + \sec x - 2 = 0$

$x^2 + x - 2$

$(x+2)(x-1)$

$(\sec x + 2)(\sec x - 1) = 0$

$\sec x = -2$	$\sec x = 1$
$\cos x = -\frac{1}{2}$	$\cos x = 1$
RA $= \frac{\pi}{3}$ 2,3	$x = 0$
$x = \frac{2\pi}{3}, \frac{4\pi}{3}$	

Ck $\sec 0 = 1$ ✓

$x = 0, \frac{2\pi}{3}, \frac{4\pi}{3}$ $[0, 2\pi)$

$(-\infty, \infty)$

$x = 2k\pi, \frac{2\pi}{3} + 2k\pi, \frac{4\pi}{3} + 2k\pi$

Feb 16-1:14 PM

HOMEWORK

p 376 1-5 odd, 25-41 odd, 47

Feb 2-9:51 PM