Homework Questions

$\sec x \cdot \cos x$

$\frac{1}{\cos x} \cdot \cos x = 1$

17 $\cot^2 x - \csc^2 x$

$\boxed{\frac{\cos^2 x}{\sin^2 x} \quad \frac{1}{\sin^2 x}}$

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

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

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

$\sec^4 x - \tan^4 x$

$(\sec^2 x + \tan^2 x)(\sec^2 x - \tan^2 x)$

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

31 $\frac{\csc x}{\cot x}$

$\csc x \cdot \frac{1}{\cot x}$

$\csc x \cdot \tan x$

$\frac{1}{\sin x} \cdot \frac{\sin x}{\cos x} = \sec x$

55 $\tan^4 x + 2\tan^2 x + 1$

$x^4 + 2x^2 + 1$

$(x^2+1)(x^2+1)$

$(\tan^2 x + 1)(\tan^2 x + 1)$

$(\sec^2 x)(\sec^2 x)$

$\sec^4 x$

59 $\csc^3 x - \csc^2 x - \csc x + 1$

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

$x^2(x-1) - 1(x-1)$

$(x^2-1)(x-1)$

$(\csc^2 x - 1)(\csc x - 1)$

$\cot^2 x(\csc x - 1)$

67 $\frac{\tan x}{1} - \frac{\sec^2 x}{\tan x}$

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

$\tan^2 x + 1 = \sec^2 x$ $\quad = -\cot x$

5.2 Verifying Trig Identities

To make one side of the equation to look like the other.

To Verify a Trig Identity you may work with one side of the equation only!!

Rules/Suggestions/Look Fors

1. $\sec y \cos y = 1$

$\frac{1}{\cos y} \cdot \cos y = 1$

$1 = 1$ ✓

2. $\frac{\sin^2 x}{\tan^2 x} = \cos^2 x$

$\frac{\sin^2 x}{1} \cdot \frac{1}{\tan^2 x} = \frac{\cancel{\sin^2 x}}{1} \cdot \frac{\cos^2 x}{\cancel{\sin^2 x}} = \cos^2 x = \cos^2 x$ ✓

3. $\cos^2 x - \sin^2 x = 2\cos^2 x - 1$

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

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

4. $(\sec\theta - \tan\theta)(\csc\theta + 1) = \cot\theta$

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

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

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

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

$$\frac{\cos^{\cancel{2}}\theta}{\cancel{\cos\theta}\sin\theta} - \frac{\cos\theta}{\sin\theta} = \cot\theta$$

5. $\frac{1+\cos\theta}{\sin\theta}+\frac{\sin\theta}{1+\cos\theta}=2\csc\theta$

$(1+\cos\theta)$ $(1+\cos\theta)$ $(\sin\theta)$ $(\sin\theta)$

$$\frac{1+2\cos\theta+\cos^2\theta}{\sin\theta(1+\cos\theta)}+\frac{\sin^2\theta}{\sin^2\theta(1+\cos^2\theta}=2\csc\theta$$

$$\frac{1+2\cos\theta+1}{\sin^2\theta(\cos\theta+1)}$$

$$\frac{2+2\cos\theta}{\sin\theta(\cos\theta+1)}$$

$2\csc\theta$

$$\frac{2\cancel{(1+\cos\theta)}}{\sin\theta\cancel{(1+\cos\theta)}}=\frac{2}{\sin\theta}=2\csc\theta$$

6. $\dfrac{sin\beta}{1-\cos\beta}=\dfrac{1+\cos\beta}{\sin\beta}$

$\sin^2\beta = 1-\cos^2\beta$

$\sin^2\beta = \sin^2\beta$

Homework

p 365

1-9 odd, 39-45 odd, 48