Day 3

Friday, November 03, 2017
4:12 PM

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

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

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

Chapter_5_
Quizzes_1

Warm-up: Determine whether each statement is true or false.

1. $\frac{\csc^2 x - 1}{\csc^2 x} = \cos^2 x$ ✓

$\frac{\cot^2 x}{\csc^2 x} = \frac{\frac{\cos^2 x}{\sin^2 x}}{\frac{1}{\sin^2 x}} = \frac{\cos^2 x}{\sin^2 x} \cdot \frac{\sin^2 x}{1} = \cos^2 x$ true.

2. $\frac{\tan^2 x + 1}{1 - \sin^2 x} = \sec^4 x$ ✓

$\frac{\sec^2 x}{\cos^2 x} = \frac{\frac{1}{\cos^2 x}}{\cos^2 x} = \frac{1}{\cos^2 x} \cdot \frac{1}{\cos^2 x} = \frac{1}{\cos^4 x} = \sec^4 x$ true

3. $\cos^3 x \csc x = \cot^3 x + \cot x$

$\cos^3 x \cdot \frac{1}{\sin^2 x}$

$\frac{\cos^3 x}{\sin x}$

$\frac{\cos^3 x}{\sin^3 x} + \frac{\cos x}{\sin x}$

$\frac{\cos^3 x}{\sin^3 x} + \frac{\cos x \sin^2 x}{\sin^3 x}$

$\frac{\cos x(\cos^2 x + \sin^2 x)}{\sin^3 x}$

$\frac{\cos x (1)}{\sin^3 x}$

$\frac{\cos x}{\sin^3 x}$

false.

Homework Questions?

Today we are just proving two sides are equal like we did in the warm-up.

* don't move anything across the equal sign

(1+cosx)

Verify $\frac{\sin x}{1-\cos x} = \csc x + \cot x$

(1+cosx)

$\frac{1}{\sin x} + \frac{\cos x}{\sin x}$

$\frac{\sin x(1+\cos x)}{1-\cos^2 x}$ $\left(\frac{1+\cos x}{\sin x}\right)$ ✓

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

$\frac{1+\cos x}{\sin x}$

Verify $2\csc x = \frac{1}{\csc x+\cot x} + \frac{1}{\csc x-\cot x}$

$\cdot(\csc x-\cot x)$ $\cdot(\csc x+\cot x)$

$\frac{2\csc x}{\csc^2 x-\cot^2 x}$ ✓

$\frac{2\csc x}{(\cot^2 x+1)-\cot^2 x}$

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

Verify $\cot x \sec x \csc^2 x - \cot^3 x \sec x = \csc x$

$\frac{\cos x}{\sin x}\cdot\frac{1}{\cos x}\cdot\frac{1}{\sin^2 x} - \frac{\cos^3 x}{\sin^3 x}\cdot\frac{1}{\cos x}$ $\cdot\left(\frac{1}{\sin x}\right)$

$\frac{1}{\sin^3 x} - \frac{\cos^2 x}{\sin^3 x}$

$\frac{\sin^2 x}{\sin^3 x}$ ✓

$\frac{1}{\sin x}$

1+secx

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

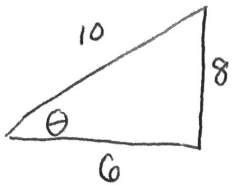
1-secx

$\frac{(1-\sec x)(\tan^2 x)}{1-\sec^2 x}$ $\sec x - 1$ ✓

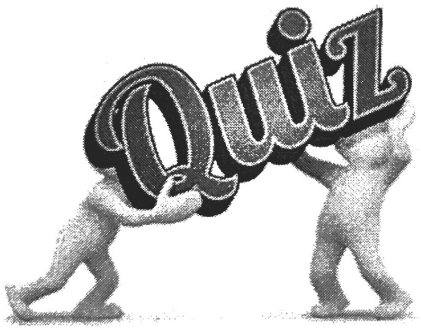
$\frac{(1-\sec x)\tan^2 x}{-\tan^2 x} = \sec x - 1$

You will practice these after the quiz today.

Quick Review $cot\ \theta = \frac{6}{8}, find\ \sin\vartheta.$



$\frac{8}{10} = \frac{4}{5}$



After the quiz, start working on Today's assignment:

Page 324 (1-31 odd)

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

9. $\frac{\cos\theta}{1 + \sin\theta} + \tan\theta = \sec\theta$
10. $\frac{\sin\theta}{1 - \cot\theta} + \frac{\cos\theta}{1 - \tan\theta} = \sin\theta + \cos\theta$
11. $\frac{1}{1 - \tan^2\theta} + \frac{1}{1 - \cot^2\theta} = 1$

12. $\frac{1}{\csc\theta + 1} + \frac{1}{\csc\theta - 1} = 2\sec^2\theta\sin\theta$
13. $(\csc\theta - \cot\theta)(\csc\theta + \cot\theta) = 1$
14. $\cos^4\theta - \sin^4\theta = \cos^2\theta - \sin^2\theta$
15. $\frac{1}{1 - \sin\theta} + \frac{1}{1 + \sin\theta} = 2\sec^2\theta$