

# Advanced Math

5-2

(Day 2)

## Verifying Trigonometric Identities

Verify each identity.

$$25) \frac{\cos\theta \cot\theta}{1 - \sin\theta} - 1 = \csc\theta$$

$$\frac{\cos\theta}{1 - \sin\theta} \cdot \frac{\cot\theta}{1} - 1 = \csc\theta$$

$$\frac{\cos\theta(1 + \sin\theta)}{(1 - \sin\theta)(1 + \sin\theta)} \cdot \frac{\cos\theta}{\sin\theta} - 1 = \csc\theta$$

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

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

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

$$\frac{1 + \sin\theta}{\sin\theta} - 1 = \csc\theta$$

$$\frac{1}{\sin\theta} + \frac{\sin\theta}{\sin\theta} - 1 = \csc\theta$$

$$\csc\theta + 1 - 1 = \csc\theta$$

$$\csc\theta = \csc\theta$$

□

Verify each identity.

$$39) \sqrt{\frac{1 + \sin\theta}{1 - \sin\theta}} = \frac{1 + \sin\theta}{|\cos\theta|}$$

$$\frac{\sqrt{(1 + \sin\theta)(1 + \sin\theta)}}{\sqrt{(1 - \sin\theta)(1 + \sin\theta)}}$$

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

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

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

$$\frac{\sqrt{\cancel{\sin^2\theta} + \cos^2\theta} - \cancel{\sin^2\theta}}{|\cos\theta|} =$$

must be  $[0, 2]$   $|1 + \sin\theta|$  range  $[-1, 1]$

$$\frac{1 + \sin\theta}{|\cos\theta|} = \frac{1 + \sin\theta}{|\cos\theta|}$$

□

Verify the identity.

$$57) \ln|\tan\theta| = \ln|\sin\theta| - \ln|\cos\theta|$$

$$= \ln\left|\frac{\sin\theta}{\cos\theta}\right|$$

$$= \ln|\tan\theta|$$

□

Assignment:  
pg. 472  
18-60 even.