

MATHEMATICS 201-BNX-05

Introduction to College Math

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QUIZ #10

Solutions

Question 1 (3 points)

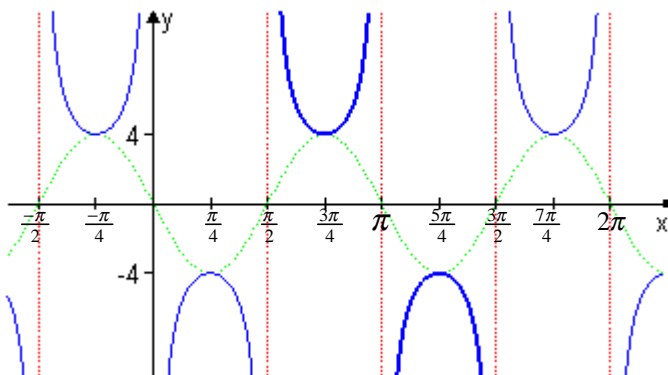
Find the period, phase shift and sketch the graph of the function.

$$y = 4 \csc(2x - \pi)$$

Period: π

Phase Shift: $\frac{\pi}{2}$

$$\left[\frac{\pi}{2}, \frac{3\pi}{2} \right]$$



Question 2 (7 points)

Verify the identity.

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

$$\begin{aligned} LS &= \frac{\sec \theta - \cos \theta}{\sec \theta} \\ &= \frac{\frac{1}{\cos \theta} - \cos \theta}{\frac{1}{\cos \theta}} \\ &= \left(\frac{1}{\cos \theta} - \cos \theta \right) \frac{\cos \theta}{1} \\ &= 1 - \cos^2 \theta \\ &= \sin^2 \theta \\ &= RS \end{aligned}$$

b) $\frac{1}{1 - \sin \theta} - \frac{1}{1 + \sin \theta} = 2 \sec \theta \tan \theta$

$$\begin{aligned} LS &= \frac{1}{1 - \sin \theta} - \frac{1}{1 + \sin \theta} \\ &= \frac{1 + \sin \theta - (1 - \sin \theta)}{(1 - \sin \theta)(1 + \sin \theta)} \\ &= \frac{2 \sin \theta}{1 - \sin^2 \theta} \\ &= \frac{2 \sin \theta}{\cos^2 \theta} \\ &= 2 \frac{1}{\cos \theta} \frac{\sin \theta}{\cos \theta} \\ &= 2 \sec \theta \tan \theta \\ &= RS \end{aligned}$$