Quiz 4 Key

Math 1060–5

Friday, September 21, 2012

Directions: Show all work for full credit. Clearly indicate all answers. Simplify all mathematical expressions completely. All graphs must be well-labeled and drawn to scale. No calculators are allowed.

1. Find the period of, and graph each of the following trigonometric functions. Include at least two periods for each graph. Be sure to include asymptotes on each graph. (17 points each)
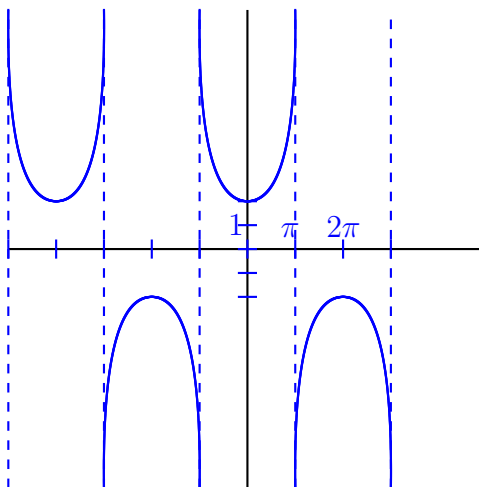
   (a) $y = \csc x$

   The period of this graph is 2π. There are vertical asymptotes at $x = 0$, π, 2π, ... (since cosecant is the reciprocal of sine, and sine is zero at multiples of π).
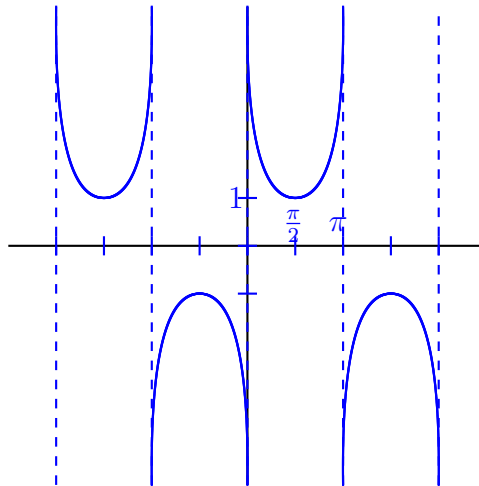
   (b) $y = 2\sec\left(\dfrac{x}{2}\right)$

   The period of this graph is $2\pi/(1/2) = 4\pi$. There are vertical asymptotes at $x = \ldots,\ -\pi,\ \pi,\ 3\pi,\ 5\pi, \ldots$.

(c) $y = -\cot(2x) + 1$

The period of this graph is $\pi/2$ (since cotangent has a period of π). The vertical asymptotes are at $x = \ldots, 0, \pi/2, \pi, \ldots$. The negative sign will "flip" the graph upside-down. The 1 will shift the graph up one.