MATH 133 – Calculus with Fundamentals 1
Practice on Trigonometric Functions
September 15, 2015

Background

In the video and class today, we have seen a "lightning review" of trigonometry. To practice on some ideas related to this, do the following problems.

Questions

1) Sinusoids

   (a) Starting from the graph $y = \sin(x)$ and using ideas we have seen about scaling and shifting, sketch the graph $y = 3\sin\left(\frac{x}{2}\right) - 1$ on the interval $[0, 8\pi]$.

   (b) The graph in part (1) is an example of a *sinusoid* (or sine-wave graph). The *amplitude* of a sinusoid is one-half the vertical distance between the minimum and maximum values. What is the amplitude of your sinusoid in (1)?

   (c) The *period* of a sinusoid $f(x)$ is the *smallest strictly positive number* T for which it is true that $f(x+T) = f(x)$ for all x. For example the period of $f(x) = \cos(x)$ is $T = 2\pi$. What is the period of the sinusoid from part (1)?

   (d) Give a formula defining a sinusoid with amplitude $A = 7$ and period $T = 5\pi$.

2) By plotting points with $0 < x < \pi$, sketch the graph $y = \cot(x) = \frac{\cos(x)}{\sin(x)}$. How are $\tan\left(x - \frac{\pi}{2}\right)$ and $\cot(x)$ related?