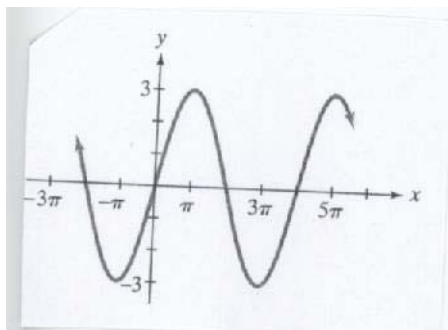


PRECALCULUS PROBLEM SESSION #10

Graphs of Sine and Cosine Functions

1. In the equations $y = A \sin(Bx - C) + D$ and $y = A \cos(Bx - C) + D$, which constants translate the graphs and which constants stretch and shrink the graphs? Describe in your own words the effect of each constant.
2. How would you shift and/or reflect the sine graph to obtain the cosine graph? (Note: there are several ways to do this)
3. Find an equation for the graph:



4. Determine the amplitude of the function $y = 5 \sin x$, then graph the function and $y = \sin x$ in the same rectangular coordinate system for $0 \leq x \leq 2\pi$.
5. Determine the amplitude and period of each function. Then graph one period of the function.
 - a. $y = \sin 4x$
 - b. $y = 5 \cos 2\pi x$.
6. Determine the amplitude, period, and phase shift of $y = 3 \sin\left(2x - \frac{\pi}{2}\right)$. Then, graph one period of the function.

Graphs of Other Trigonometric Functions

1. Graph two periods of each function:
 - a. $y = \tan\left(x - \frac{\pi}{4}\right)$
 - b. $y = \frac{1}{2} \cot x$
 - c. $y = 2 \csc x$
 - d. $y = 2 \tan 2x$
2. How would you shift and/or reflect the tangent graph to obtain the cotangent graph? (Note: there are several ways to do this)
3. Find the period and phase shift for the following functions, and graph:

a. $y = \frac{1}{2} \tan\left(\frac{x}{4} + \frac{\pi}{4}\right)$ b. $y = -2 \sec\left(4x - \frac{\pi}{2}\right)$

4. The graph of a tangent function is given. Select the equation that matches the given graph from the following options: $y = \tan\left(x + \frac{\pi}{2}\right)$, $y = \tan(x + \pi)$, $y = -\tan x$, $y = -\tan\left(x - \frac{\pi}{2}\right)$.

