Steps for graphing Sine and Cosine Functions

Using the basic sine function set-up: $y = A \sin(Bx + C)$ or $y = A \cos(Bx + C)$ 1. Identify A =______, B =______, C =_____ 2. Find the Amplitude: |A|3. Find the Period: $\frac{2\pi}{B}$ 4. Find the "increment": $\frac{Period}{4}$ 5. Find the Phase Shift: $\frac{-C}{B}$ (*remember that this is the x_1 key point) 6. Find the 5 key points: $x_1 = Phase Shift$ $x_2 = x_1 + increment$ $x_3 = x_2 + increment$ $x_4 = x_3 + increment$

 $x_5 = x_4 + increment$

7. Identify the appropriate "pattern":

Type Fn Key Points	<i>x</i> ₁	<i>x</i> ₂	<i>x</i> ₃	<i>x</i> ₄	<i>x</i> ₅
"sine"	x-intercept	Max	x-intercept	Min	x-intercept
" - sine"	x-intercept	Min	x-intercept	Max	x-intercept
"cosine"	Max	x-intercept	Min	x-intercept	max
"-cosine"	Min	x-intercept	Max	x-intercept	Min

- 8. Plot information on the X-Y coordinate system.
- 9. Vertical Shifts use when necessary.

*If there is a constant number tacked onto the end of the equation, then this would indicate a vertical shift. You would simply move the graph up or down the appropriate number of units.

 $Ex. \ y = 3\cos(2x+1) - 5$

Notice the "-5" tacked on the end of the function – this indicates a vertical shift – down 5 units. To graph this function you would initially ignore the "-5" at the end and use steps #1 - 8 to graph the function $y = 3\cos(2x+1)$. After you get this graph, you would shift the graph down 5 units.