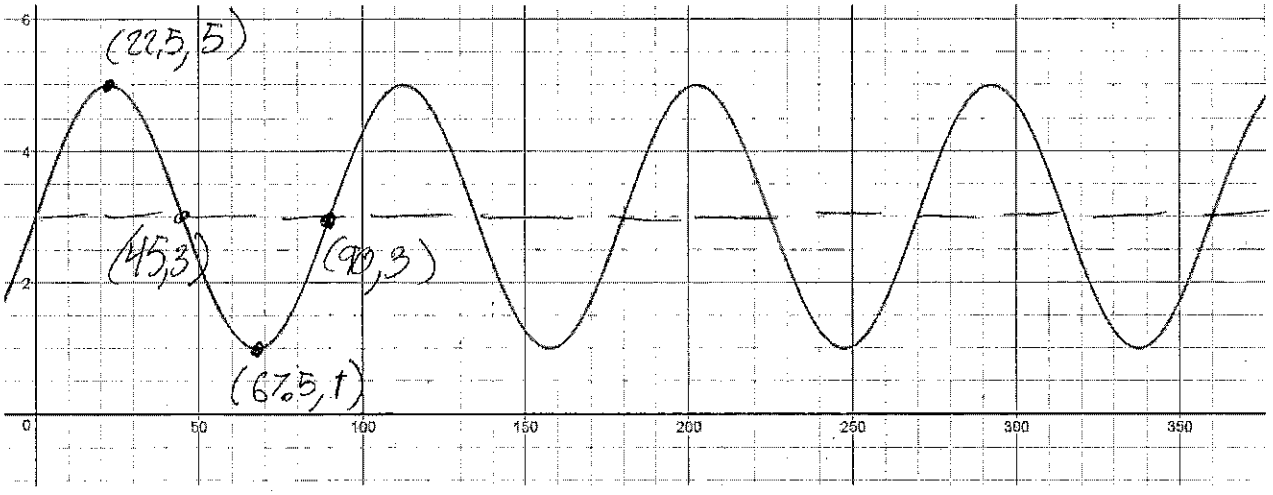
CCSS Advanced Algebra 4 Writing & Graphing Trigonometric Functions Name_____

1. For the graph below,
   a. Draw the midline.
   b. Label the coordinate points (x,y) of the maximum and minimum points.
   c. Label the coordinate points where the curve crosses the midline.



   d. How can you use your drawing to find the
      i. Amplitude? 2 Distance from midline to top or bottom
      ii. Frequency and Period? 4 90 $\frac{360}{\text{period}} = \text{frequency}$
      iii. Vertical Translation (or Midline)? 3
   e. What is the equation of the sine curve shown? In the form $f(x) = a\ sin(b(x + c)) + d$

$y = 2\sin 4x + 3$

2. Consider the function $f(x) = 3\ sin(2x) - 1$
   a. What is the Amplitude of the sine curve? 3
   b. What is the Frequency and Period of the sine curve? 2 180°
   c. What is the Midline of the sine curve? -1
   d. Write the range of the function in the form $\# \le y \le \#$.

$-4 \le y \le 2$

   e. What will be the coordinates (x,y) of first maximum point on the sine curve? The first minimum point? Recall that x = degrees and y = height.

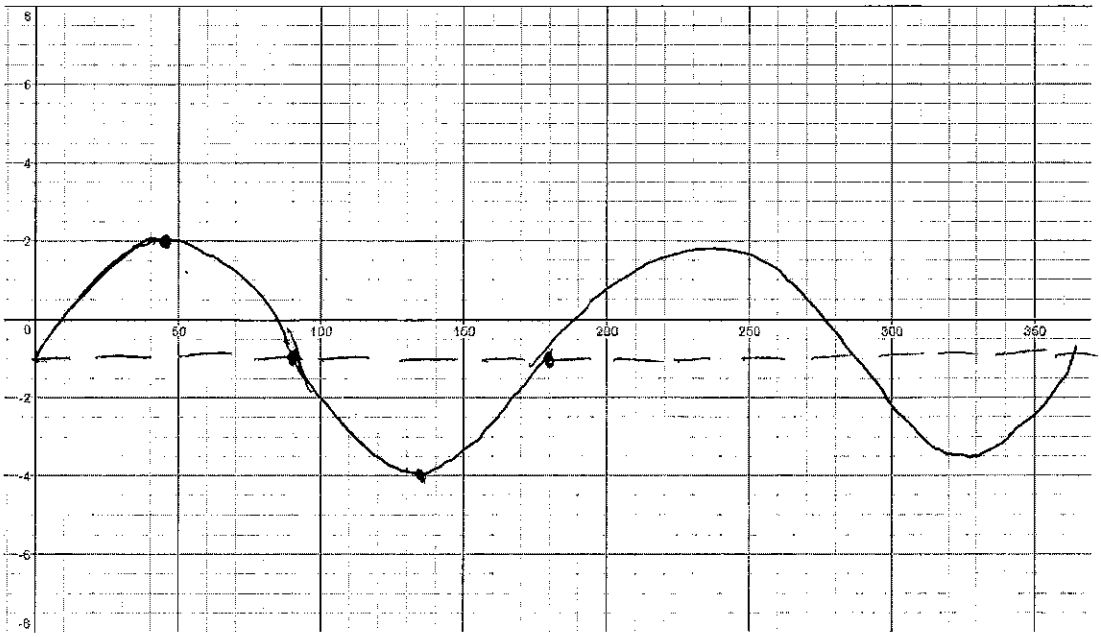
Max $x = 45, y = 2$

Min $x = 135, y = -4$

   f. What will be the coordinates (x,y) where the sine curve crosses the midline?

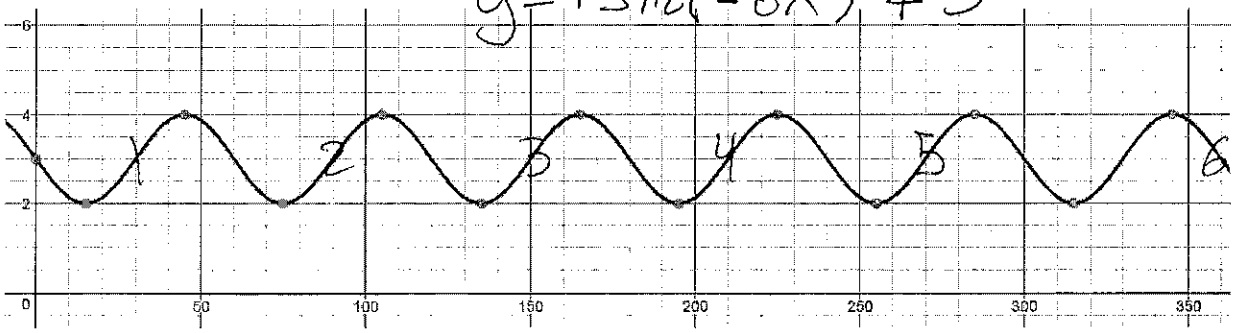
$x = 90, y = -1$

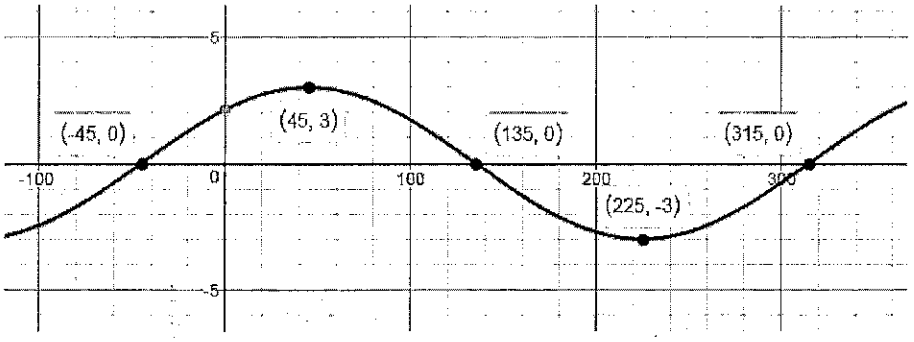
g. On the axes below, Draw
   i. the midline
   ii. the points showing the first maximum and first minimum.
   iii. the points where the sine curve crosses the midline.



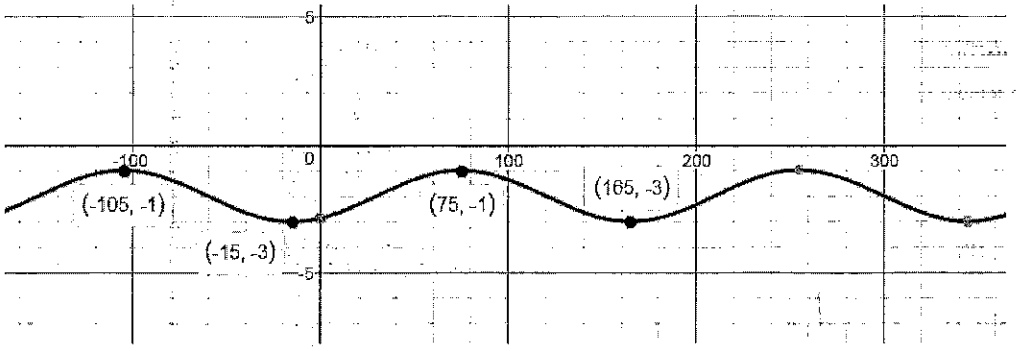
3. Use a strategy similar to #1 to find the equation for each sine curve shown below in the form $y = a\ sin(b(x + c)) + d$.

$y = 1\sin(-6x) + 3$





$y = 3\sin(x + 45)$



$y = \sin(2(x - 30)) - 1$