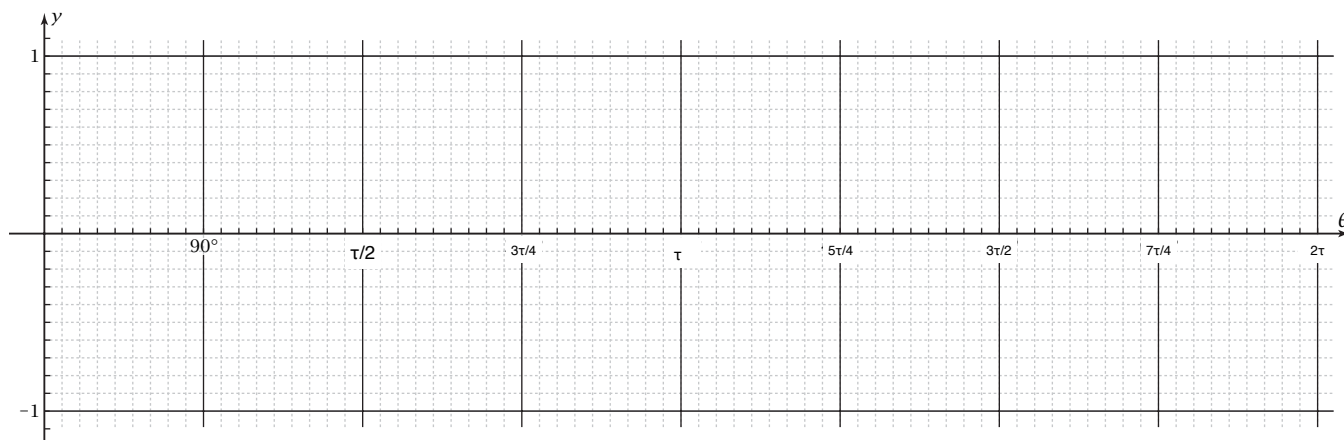
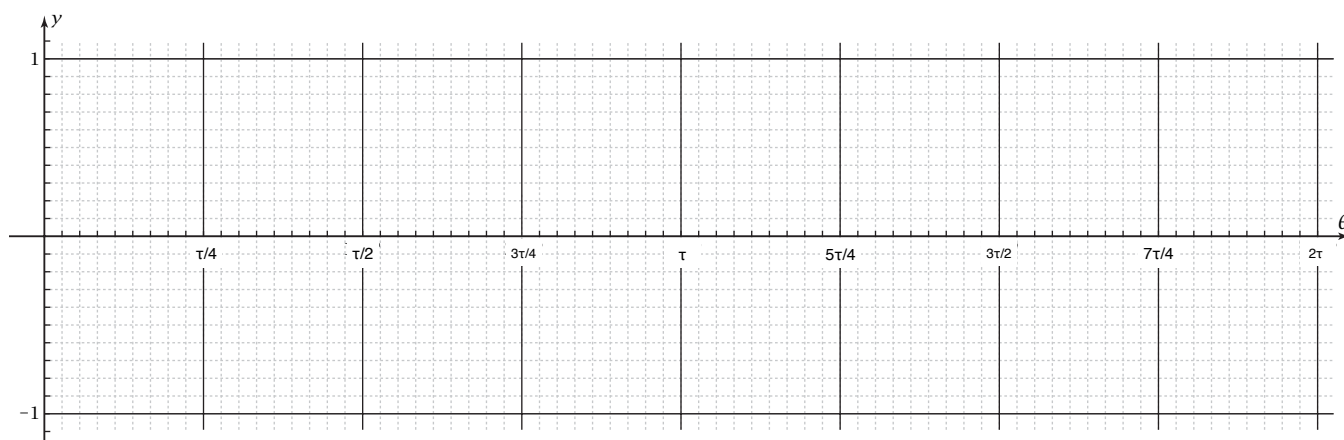


Exploration 3-1b: Sine and Cosine Graphs, Manually Date: _____**Objective:** Find the shape of sine and cosine graphs by plotting them on graph paper.

1. On your grapher, make a table of values of $y = \sin \theta$ for each $\pi/36$ from 0π to $\pi/4$. Set the mode to round to 2 decimal places. Plot the values on this graph paper. Also plot $y = \sin \theta$ for each $\pi/4$ through 2π . Connect the points with a smooth curve, observing the shape you plotted for 0π to $\pi/4$.



2. Plot the graph of $y = \cos \theta$ pointwise, the way you did for sine in Problem 1.



3. Find $\sin^{-1} \frac{\pi}{8}$ and $\cos^{-1} \frac{13\pi}{72}$. Show that the corresponding points are on the graphs in Problems 1 and 2, respectively.
4. Find the inverse trigonometric functions $\theta = \sin^{-1} 0.4$ and $\theta = \cos^{-1} 0.8$. Show that the corresponding points are on the graphs in Problems 1 and 2, respectively.
5. What are the ranges of the sine and cosine functions?
6. Name a real-world situation where variables are related by a periodic graph like sine or cosine.
7. What did you learn as a result of doing this Exploration that you did not know before?