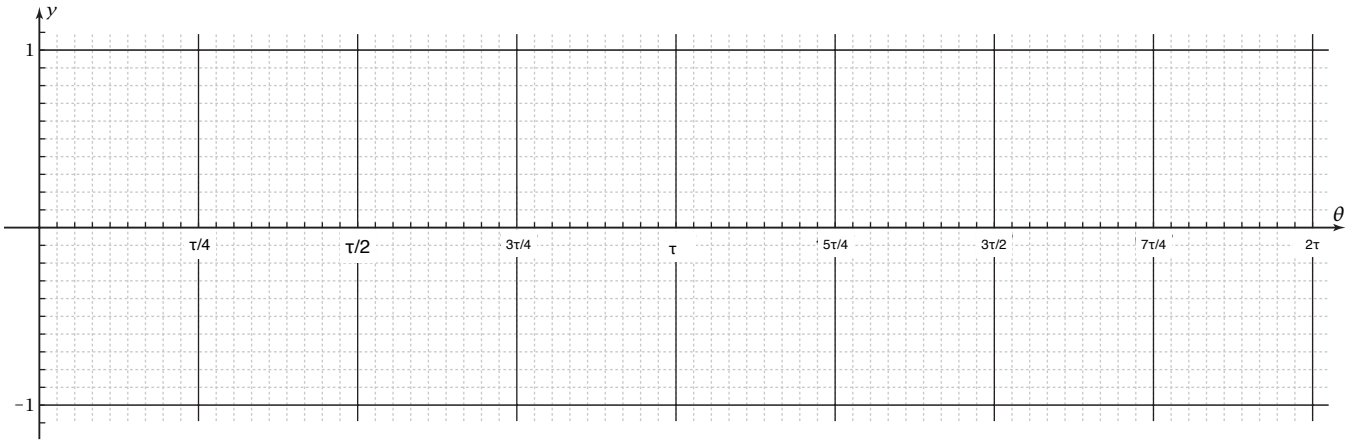
Name: _____ Group Members: _____

Exploration 3-1b: Sine and Cosine Graphs, Manually

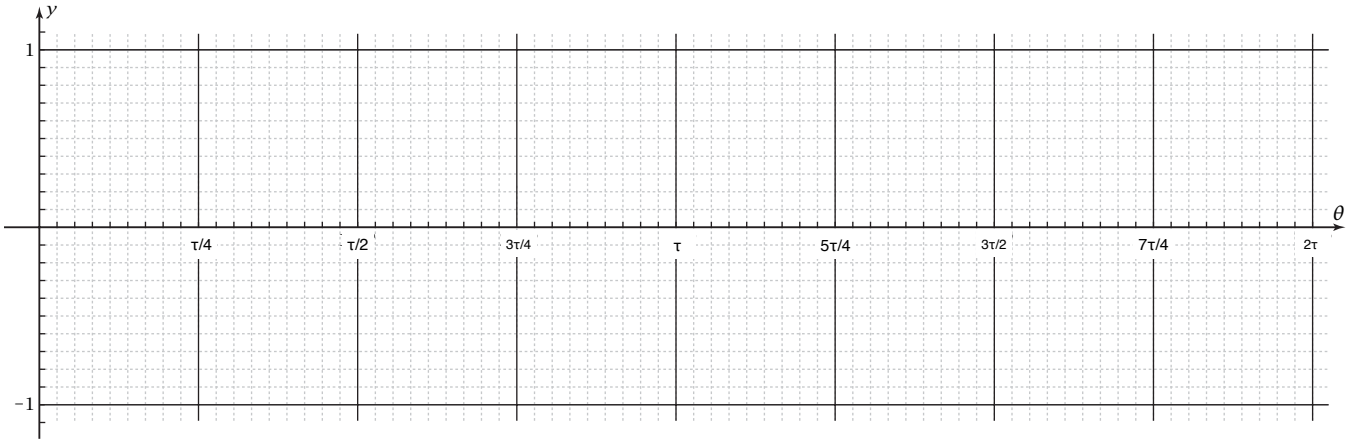
Date: _____

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



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



3. Find sin τ/8 and cos $\frac{13\tau}{72}$. 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?

© 2007 Key Curriculum Press