

Project 1: Graphs of Sine and Cosine

Read the directions carefully! Points will be deducted for missing parts. Turn in pages 2 through 5, stapled in order, with your group members' names at the bottom of page 2. This project is worth 36 points.

Objectives:

1. Understand the definition of $\sin(x)$ and $\cos(x)$ for all angles.
2. Practice labeling and memorizing the standard **degree** angles on the unit circle.
3. Practice visualizing the unit circle definitions of $\sin(x)$ and $\cos(x)$.
4. Create good graphs by hand, as a way of working to understand and memorize the sine and cosine functions' behavior.

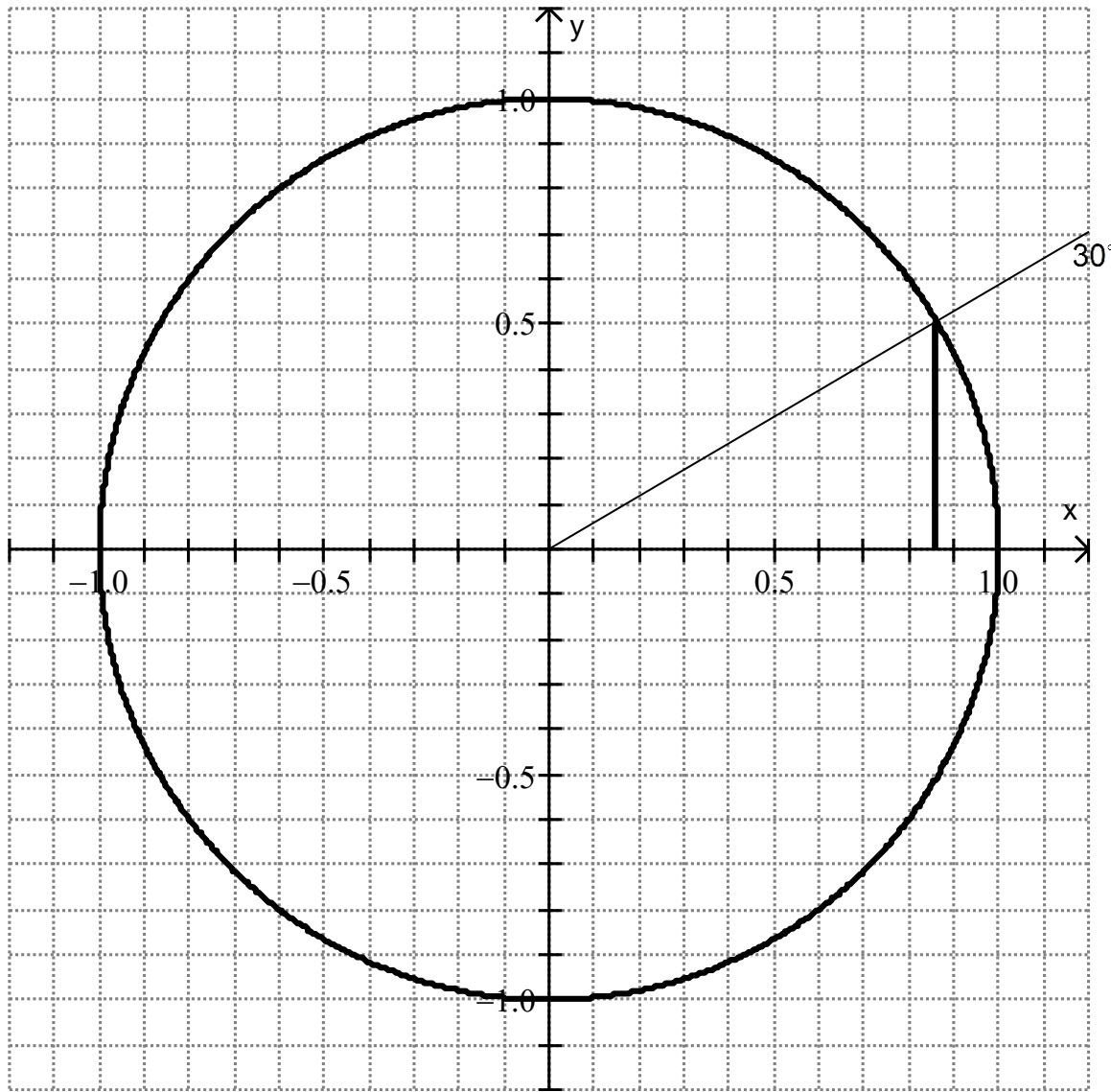
Directions for the graph of $y = \sin(x)$: Do on pages 2 and 4.

1. Use your protractor to draw the standard angles accurately on the graph of the unit circle.
2. Label each angle with the proper degree measure, from 0° to 360° . *
3. **Draw vertical lines all around the unit circle, showing $\sin(x)$ for every angle you've drawn.** *
4. Fill in the table with the values of $\sin(x)$, through $x = 360^\circ$. (Some have been filled in for you.)
5. Graph $y = \sin(x)$ on page 4, being neat and exact. Label each point from your table with its *exact* coordinates. Go all the way from the left edge to the right edge of the graph paper.

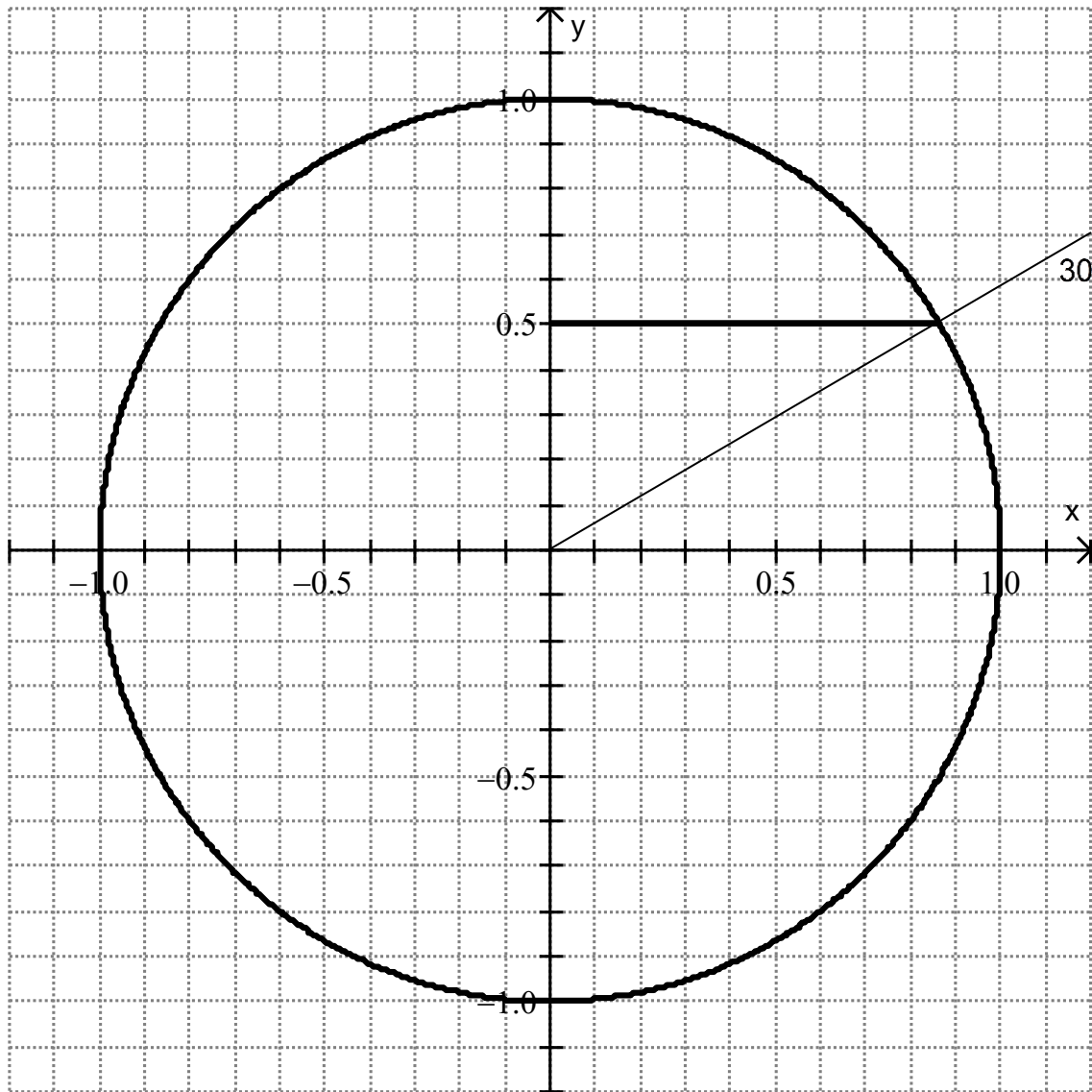
Directions for the graph of $y = \cos(x)$: Do on pages 3 and 5.

1. Use your protractor to draw the standard angles accurately on the graph of the unit circle.
2. Label each angle with the proper degree measure, from 0° to 360° . *
3. **Draw horizontal lines all around the unit circle, showing $\cos(x)$ for every angle you've drawn.** *
4. Fill in the table with the values of $\cos(x)$, through $x = 360^\circ$. (Some have been filled in for you.)
5. Graph $y = \cos(x)$ on page 5, being neat and exact. Label each point from your table with its *exact* coordinates. Go all the way from the left edge to the right edge of the graph paper.

* These steps have been done for the angle 30° as an example.



x (in degrees)	$\sin(x)$ (decimal)	$\sin(x)$ (radical or fraction)
0°	0.00	0
30°	0.50	$\frac{1}{2}$
45°	0.71	$\frac{\sqrt{2}}{2}$
60°	0.87	$\frac{\sqrt{3}}{2}$
90°	1.00	1
120°		
135°		



x (angle)	$\cos(x)$ (decimal)	$\cos(x)$ (radical or fraction)
0°	1.00	1
30°	0.87	$\frac{\sqrt{3}}{2}$
45°	0.71	$\frac{\sqrt{2}}{2}$
60°	0.50	$\frac{1}{2}$
90°	0.00	0
120°		
135°		

