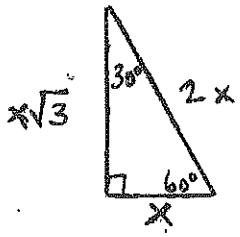
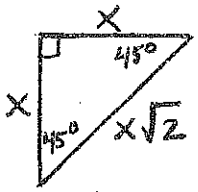
SEC
11.4

Honors Pre-calculus
The Unit Circle

Name _____
Date _____

Your job in this project is to work with a partner to find an *exact form* (usually a radical) for the x and y coordinate values for the point where the terminal side of the angle θ intersects the unit circle. Do not use your book or your calculator. Instead, use the facts you know about the relationships between the sides of a 30°-60°-90° triangle and a 45°-45°-90° triangle. For your reference:





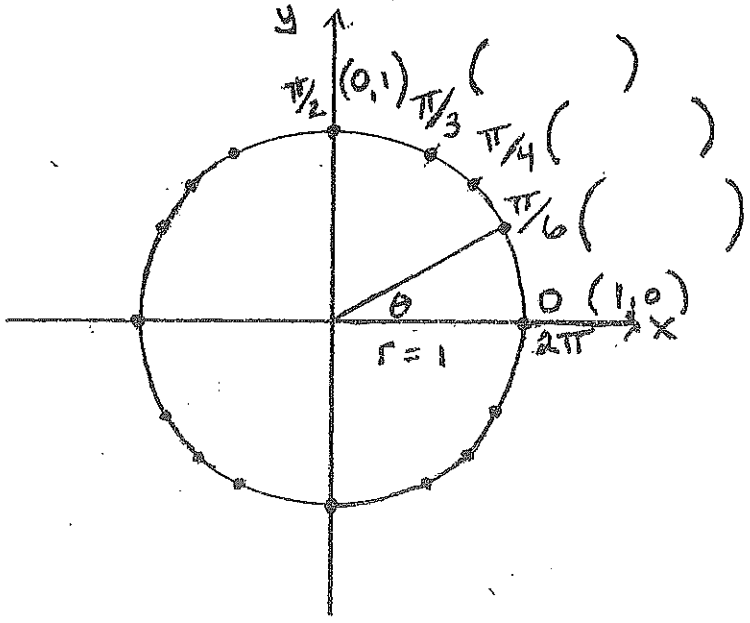
First, find sin θ and cos θ for $\theta = 0°$ or 0, 30° or $\pi/6$, 45° or $\pi/4$, 60° or $\pi/3$, and 90° or $\pi/2$.

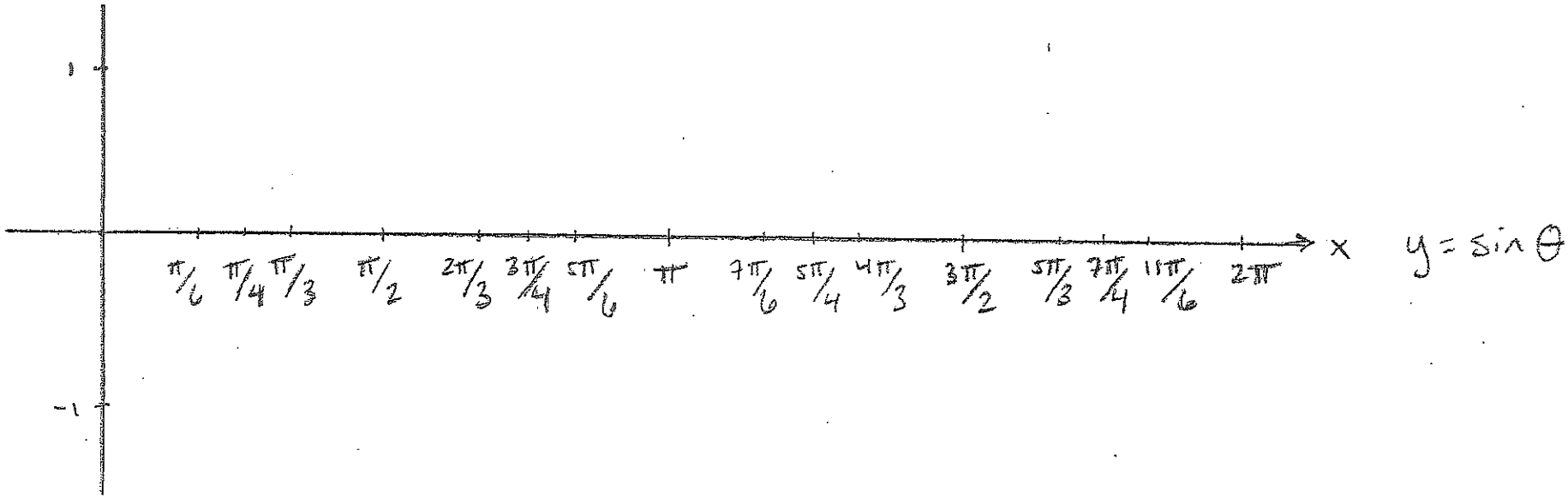
Then use your work above and your knowledge of geometry to complete the table below with the (x, y) values for all sixteen points:

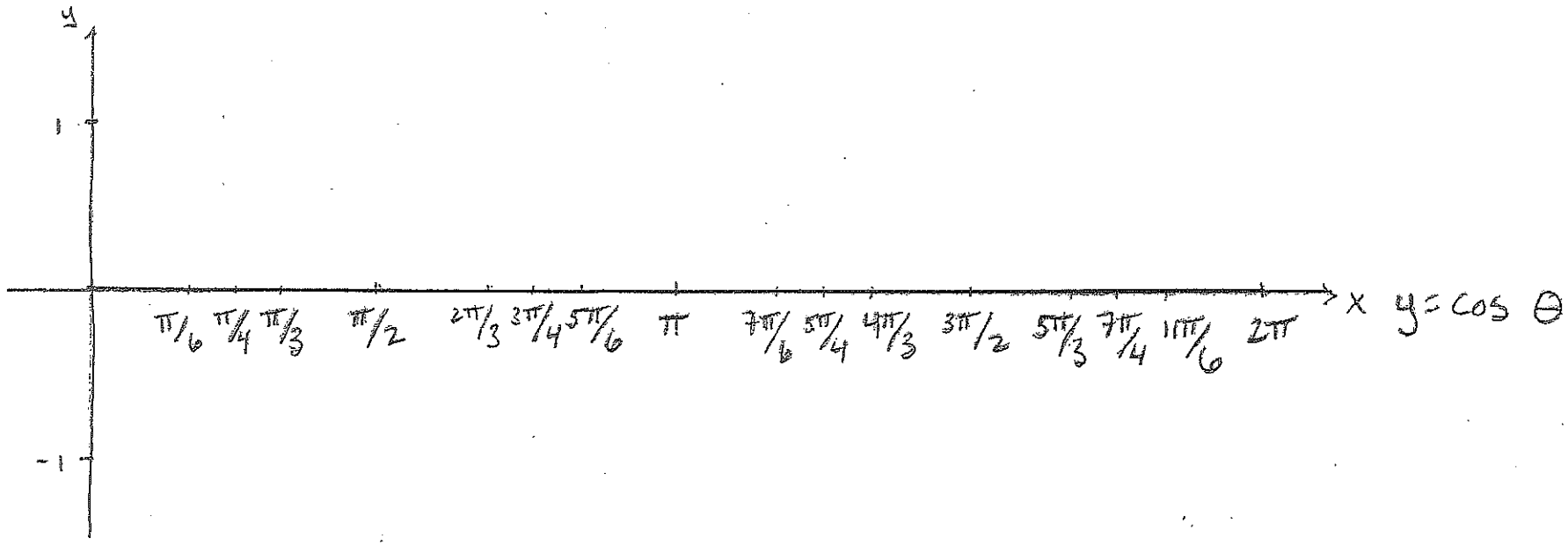
	0° or 0	30° or $\pi/6$	45° or $\pi/4$	60° or $\pi/3$	90° or $\pi/2$	120° or $2\pi/3$	135° or $\pi/4$	150° or $5\pi/6$	180° or π	210° or $7\pi/6$	225° or $5\pi/4$	240° or $4\pi/3$	270° or $3\pi/2$	300° or $5\pi/3$	315° or $7\pi/4$	330° or $11\pi/6$	360° or 2π
sin θ																	
cos θ																	

tan θ

Now take out your calculator, make sure it is in the appropriate mode, and verify for yourself that the exact values in your chart and the decimal approximations found using the trig keys are equivalent. Once you have verified your work, complete the unit circle below:




1
-1
x
$\pi/6$ $\pi/4$ $\pi/3$ $\pi/2$ $2\pi/3$ $3\pi/4$ $5\pi/6$ π $7\pi/6$ $5\pi/4$ $4\pi/3$ $3\pi/2$ $5\pi/3$ $7\pi/4$ $11\pi/6$ 2π
$y = \sin\theta$


y
1
-1
x
$\pi/6$ $\pi/4$ $\pi/3$ $\pi/2$ $2\pi/3$ $3\pi/4$ $5\pi/6$ π $7\pi/6$ $5\pi/4$ $4\pi/3$ $3\pi/2$ $5\pi/3$ $7\pi/4$ $11\pi/6$ 2π
$y = \cos\theta$