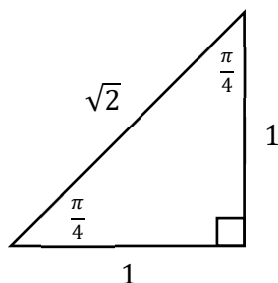


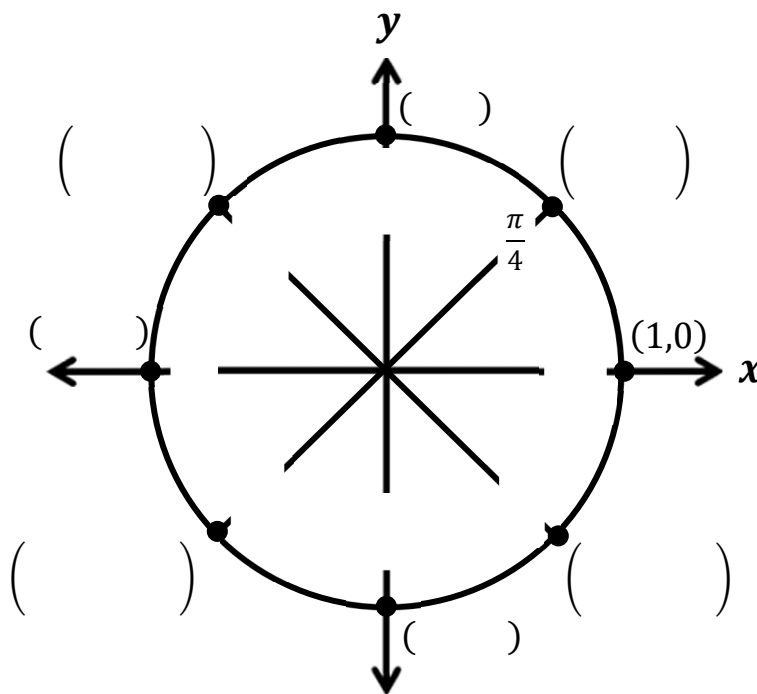
Write your questions
and thoughts here!The $45^\circ, 45^\circ, 90^\circ$ triangle in terms of π radians:

$$\sin \frac{\pi}{4} =$$

$$\cos \frac{\pi}{4} =$$

The Unit Circle – multiples of $\frac{\pi}{4}$

Recall from our last lesson that on a unit circle $\cos \theta = x$ and $\sin \theta = y$. This allows us to obtain the following coordinate points for all multiples of $\frac{\pi}{4}$.



Now we can evaluate sine and cosine for all angles that are multiples of $\frac{\pi}{4}$. While evaluating the below trig expressions, try not to look at the above unit circle. You want to memorize the unit circle so that you can answer these problems quickly. In elementary school, you had multiplication tables that you had to memorize. If you never memorized them, math classes became more challenging. That's how this works as well. If you don't get the coordinate points on the unit circle memorized with their associated angles, then precalculus and calculus become more challenging.

Find the value of each expression. Try not to look back at the Unit Circle for help.

1. $\sin \frac{\pi}{4}$

2. $\cos \frac{3\pi}{4}$

3. $\sin \pi$

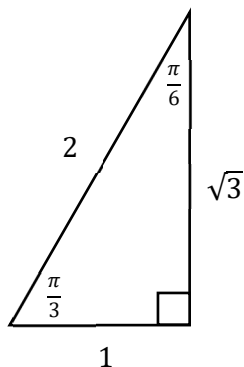
4. $\cos \frac{7\pi}{4}$

5. $\sin \left(-\frac{3\pi}{4}\right)$

6. $\cos \left(-\frac{7\pi}{4}\right)$

Write your questions and thoughts here!

The 30°, 60°, 90° triangle in terms of π radians:



$$\sin \frac{\pi}{6} =$$

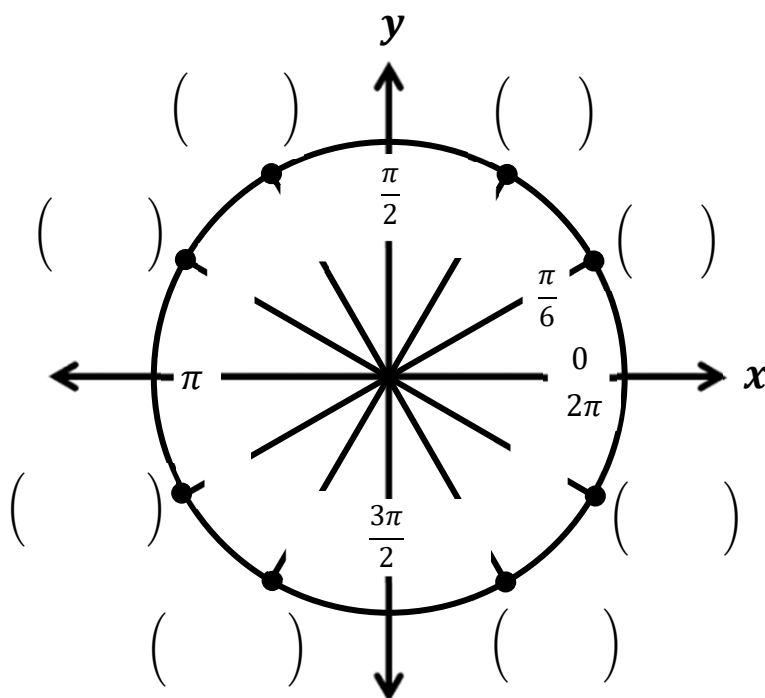
$$\sin \frac{\pi}{3} =$$

$$\cos \frac{\pi}{6} =$$

$$\cos \frac{\pi}{3} =$$

The Unit Circle – multiples of $\frac{\pi}{6}$

We can now find the coordinate points for all multiples of $\frac{\pi}{6}$.



Find the value of each expression. Try not to look back at the Unit Circle for help.

7. $\sin\left(-\frac{\pi}{6}\right)$

8. $\cos\frac{\pi}{3}$

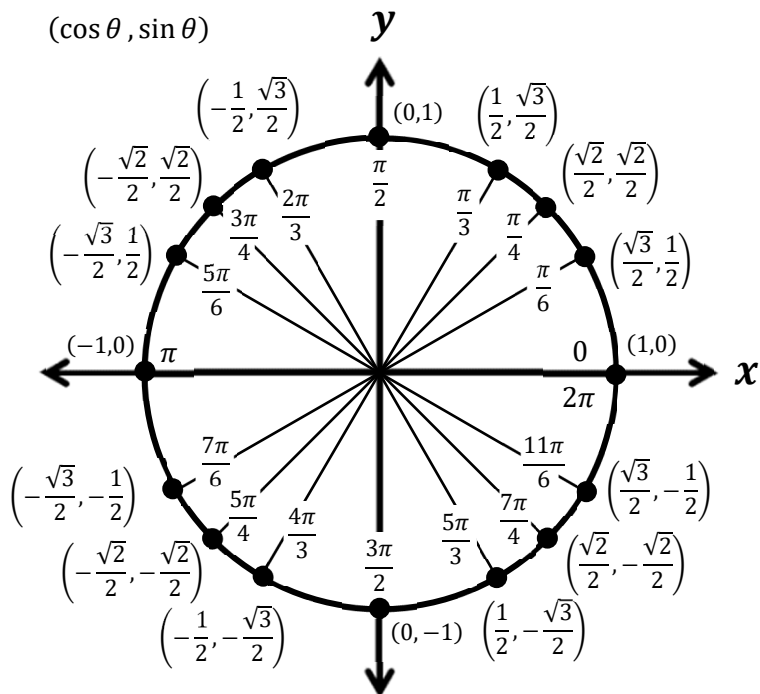
9. $\sin\frac{2\pi}{3}$

10. $\cos\left(\frac{5\pi}{6}\right)$

11. $\cos\left(-\frac{\pi}{2}\right)$

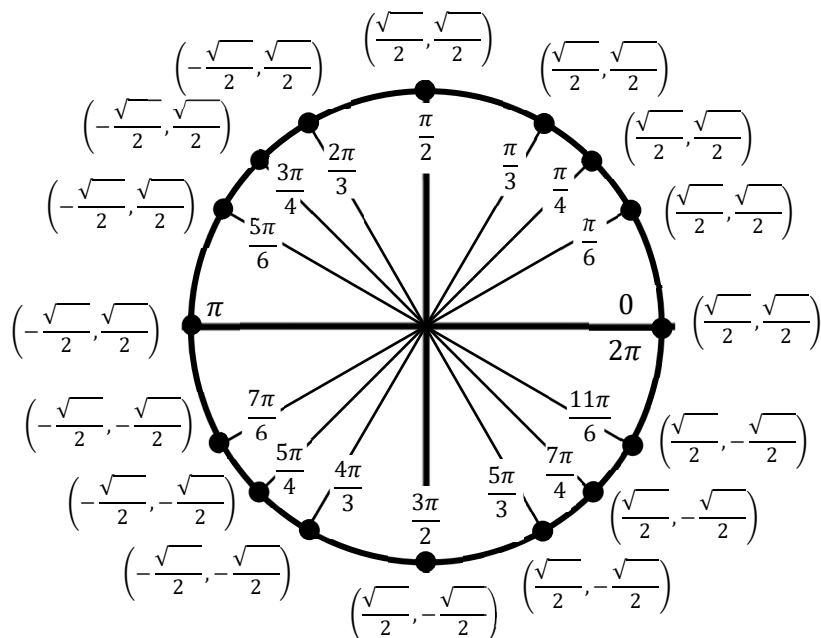
12. $\sin\frac{4\pi}{3}$

The completed unit circle:



Tips and Tricks!

- There is a pattern where every coordinate can be written as $(\frac{\sqrt{\quad}}{2}, \frac{\sqrt{\quad}}{2})$. Start with “zero” coordinates and count up.
- All the angles that contain $\frac{\pi}{4}$ are halfway between the x - and y -axis.
- All the angles that contain $\frac{\pi}{6}$ are one angle away from the x -axis.
- All the angles that contain $\frac{\pi}{3}$ are one angle away from the y -axis.



3.3A Sine and Cosine Function Values

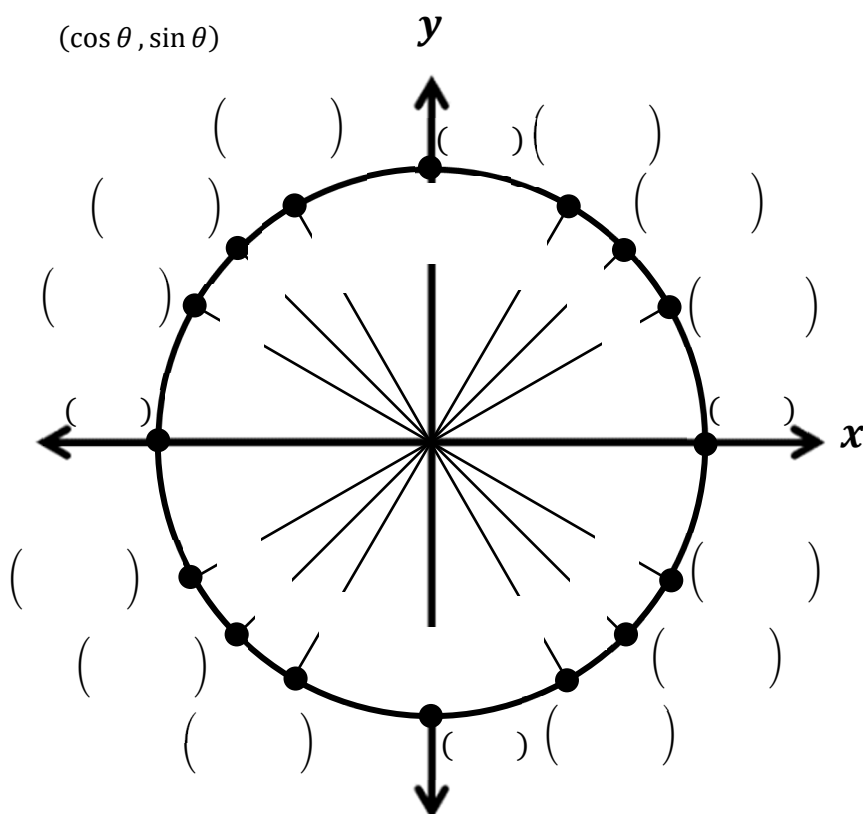
AP Precalculus

3.3A Practice

Find the value of each expression. Try not to look back at the Unit Circle for help.

1. $\sin \frac{3\pi}{2}$	2. $\cos \frac{\pi}{2}$	3. $\sin \frac{\pi}{6}$	4. $\cos \frac{\pi}{4}$	5. $\sin \frac{5\pi}{6}$	
6. $\cos \frac{7\pi}{6}$	7. $\cos \frac{4\pi}{3}$	8. $\sin \frac{5\pi}{3}$	9. $\cos \left(-\frac{7\pi}{6}\right)$	10. $\cos \left(-\frac{\pi}{3}\right)$	
11. $\sin \left(-\frac{3\pi}{4}\right)$	12. $\cos \frac{\pi}{3}$	13. $\sin \frac{\pi}{2}$	14. $\sin \frac{2\pi}{3}$	15. $\cos 2\pi$	
16. $\cos \frac{5\pi}{6}$	17. $\sin \frac{\pi}{3}$	18. $\cos \left(-\frac{2\pi}{3}\right)$	19. $\sin \frac{\pi}{4}$	20. $\cos \frac{11\pi}{6}$	
21. $\sin \left(-\frac{\pi}{6}\right)$	22. $\cos \frac{\pi}{6}$	23. $\sin 0$	24. $\sin \left(-\frac{5\pi}{4}\right)$	25. $\sin \frac{4\pi}{3}$	26. $\sin \pi$

27. Fill in the unit circle below by labeling all of the angles and coordinate points. Do all that you can without looking back at your notes. This will help you know how much you still need to study it.



No test prep for this lesson!