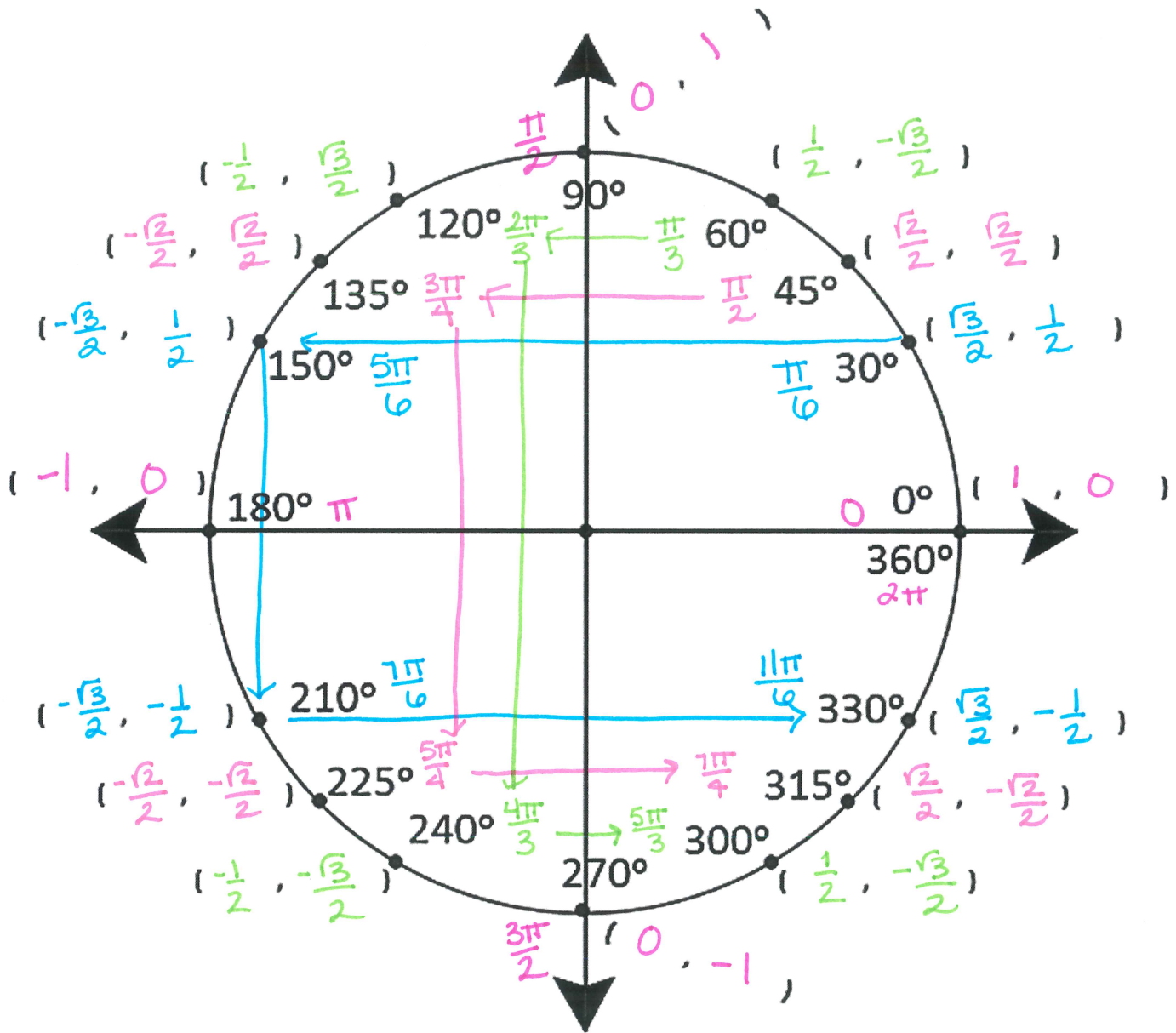


Name: \_\_\_\_\_

Key

## UNIT CIRCLE and Exact Values HW

Directions: Without using a completed Unit Circle, fill out the radians and points which lie on the Unit Circle given the degrees below.



Directions: Use your unit circle to find the exact values of each expression below. Show what coordinate you used for the each question. This will be considered as your work for each question.

1.  $\cos \frac{\pi}{2}$  (0, 1)

$\cos \frac{\pi}{2} = 0$

2.  $\sin \frac{7\pi}{6}$  ( $-\frac{\sqrt{3}}{2}, -\frac{1}{2}$ )

$\sin \frac{7\pi}{6} = -\frac{1}{2}$

3.  $\cos \frac{4\pi}{3}$  ( $-\frac{1}{2}, -\frac{\sqrt{3}}{2}$ )

$\cos \frac{4\pi}{3} = -\frac{1}{2}$

4.  $\tan \frac{7\pi}{4}$  ( $\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}$ )

$\tan \frac{7\pi}{4} = -1$

5.  $\sin \frac{3\pi}{2}$  (0, -1)

$\sin \frac{3\pi}{2} = -1$

6.  $\tan \frac{7\pi}{6}$  ( $-\frac{\sqrt{3}}{2}, -\frac{1}{2}$ )

$\frac{-\frac{1}{2}}{-\frac{\sqrt{3}}{2}} = -\frac{1}{2} \cdot -\frac{2}{\sqrt{3}} = \frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{2\sqrt{3}}{\sqrt{9}} = \frac{\sqrt{3}}{3}$   
 $\tan \frac{7\pi}{6} = \frac{\sqrt{3}}{3}$

7.  $\tan 2\pi$  (1, 0)

$\tan 2\pi = \frac{0}{1} = 0$

8.  $\cos \pi$  (-1, 0)

$\cos \pi = -1$

9.  $\sin \frac{11\pi}{6}$  ( $\frac{\sqrt{3}}{2}, -\frac{1}{2}$ )

$\sin \frac{11\pi}{6} = -\frac{1}{2}$

10.  $\tan 2\pi$  (-1, 0)

$\tan 2\pi = \frac{0}{-1} = 0$

11.  $\tan \frac{\pi}{3}$  ( $\frac{1}{2}, \frac{\sqrt{3}}{2}$ )

$\tan \frac{\pi}{3} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \frac{\sqrt{3}}{2} \cdot \frac{2}{1} = \sqrt{3}$

12.  $\tan \frac{\pi}{2}$  (0, 1)

$\tan \frac{\pi}{2} = \frac{1}{0}$   
 undefined

13.  $\sin 45^\circ$  ( $\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}$ )

$\sin 45^\circ = \frac{\sqrt{2}}{2}$

14.  $\cos 150^\circ$  ( $-\frac{\sqrt{3}}{2}, \frac{1}{2}$ )

$\cos 150^\circ = -\frac{\sqrt{3}}{2}$

15.  $\tan 240^\circ$  ( $-\frac{1}{2}, -\frac{\sqrt{3}}{2}$ )

$\tan 240^\circ = \frac{-\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = -\frac{\sqrt{3}}{2} \cdot -\frac{2}{1}$

$\tan 240^\circ = \sqrt{3}$

16.  $\tan 315^\circ$  ( $\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}$ )

$\tan 315^\circ = -1$

17.  $\sin 270^\circ$  (0, -1)

$\sin 270^\circ = -1$

18.  $\cos 210^\circ$  ( $-\frac{\sqrt{3}}{2}, -\frac{1}{2}$ )

$\cos 210^\circ = -\frac{\sqrt{3}}{2}$

19.  $\tan 0^\circ \Rightarrow$  (1, 0)

$\tan 0^\circ = \frac{0}{1} = 0$

20.  $\cos 180^\circ$  (-1, 0)

$\cos 180^\circ = -1$

21.  $\sin 330^\circ$  ( $\frac{\sqrt{3}}{2}, -\frac{1}{2}$ )

$\sin 330^\circ = -\frac{1}{2}$

22.  $\tan 120^\circ$  ( $-\frac{1}{2}, \frac{\sqrt{3}}{2}$ )

$\frac{\frac{\sqrt{3}}{2}}{-\frac{1}{2}} \Rightarrow \tan 120^\circ = -\sqrt{3}$

23.  $\tan 135^\circ$  ( $-\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}$ )

$\tan 135^\circ = -1$

24.  $\tan 240^\circ$  ( $-\frac{1}{2}, -\frac{\sqrt{3}}{2}$ )

$\tan 240^\circ = \frac{-\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = -\frac{\sqrt{3}}{2} \cdot -\frac{2}{1}$

$\tan 240^\circ = \sqrt{3}$

25. If  $\sin \theta = -\frac{\sqrt{3}}{2}$  and  $\theta = \frac{b\pi}{3}$  on the unit circle, give at least one possible value for b.

$\frac{5\pi}{3}$  or  $\frac{4\pi}{3}$