Definition:
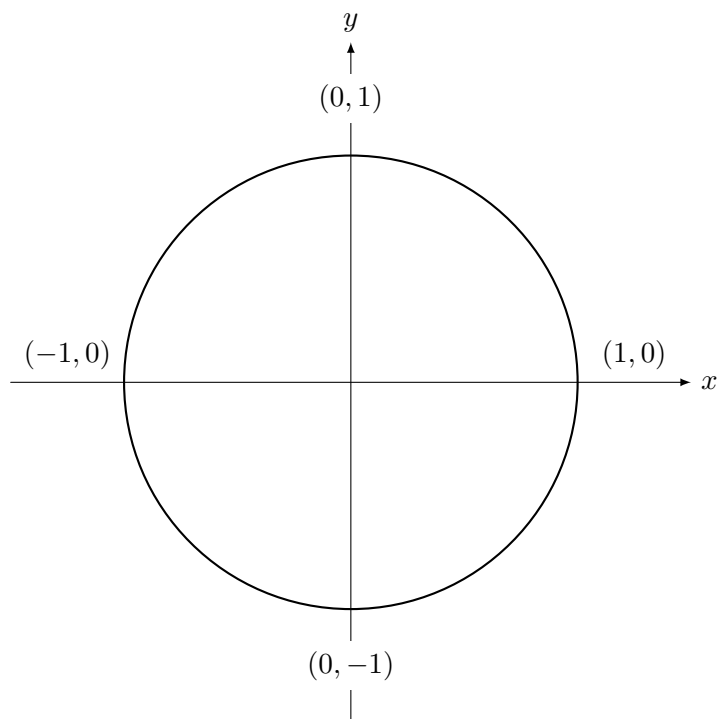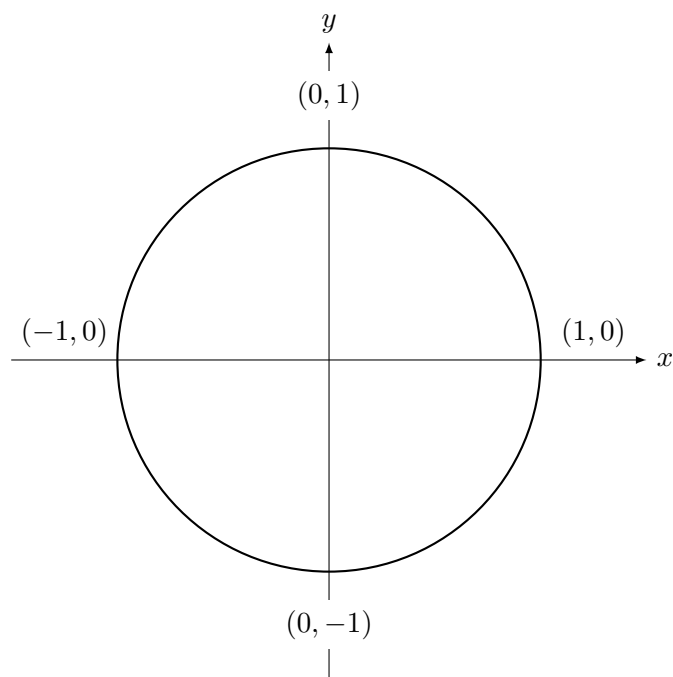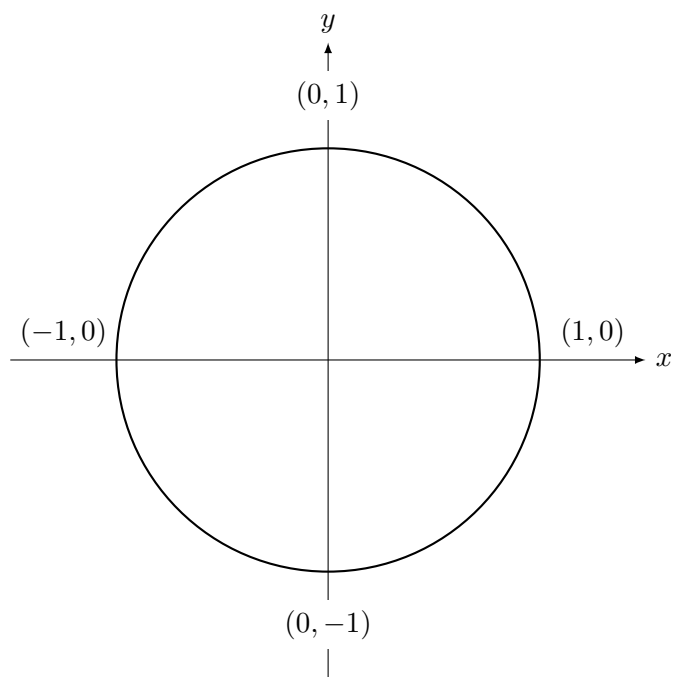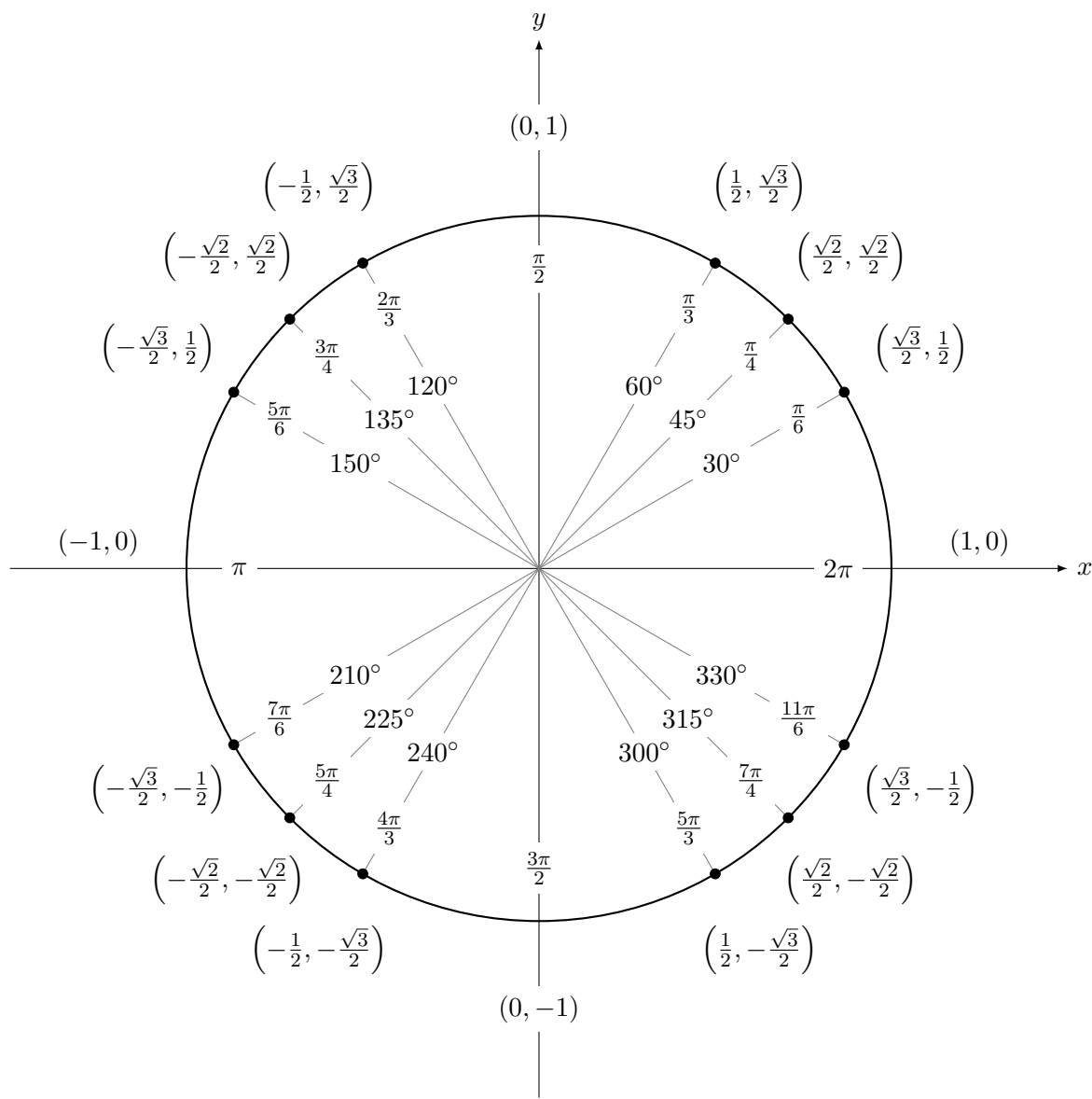

Trigonometric Functions:

Identities:

1. Let $W(t) = (x, y)$ on the unit circle for angle t.

   - Find $W(t)$ for $t = \frac{5\pi}{6}$, $t = \frac{-\pi}{3}$, $t = \frac{-\pi}{2}$, $t = \frac{-5\pi}{4}$.

2. Find the exact value of the following, or state that it is undefined.

   - $\sin\left(\frac{5\pi}{6}\right)$, $\cos\left(\frac{-4\pi}{3}\right)$, $\tan\left(\frac{-\pi}{3}\right)$, $\sec\left(\frac{5\pi}{3}\right)$, $\tan\left(\frac{-\pi}{6}\right)$.

3. Determine whether $S(x) = \dfrac{\sin x}{x}$, $x \neq 0$, is even, odd, or neither.

4. Determine whether $z(x) = 2 \sin x \cos x$ is even, odd, or neither.

5. Show that $\left(\dfrac{\sqrt{3}}{3}, \dfrac{\sqrt{6}}{3} \right)$ is on the unit circle.

6. If $\left(x, \dfrac{4}{5} \right)$ is on the unit circle in quadrant I, find x.

7. If $\left(\dfrac{\sqrt{3}}{2}, y \right)$ is on the unit circle in quadrant IV, find y.

8. If the angle t determines the point $\left(\dfrac{-6}{7}, \dfrac{\sqrt{13}}{7} \right)$ on the unit circle, find $\sin t$, $\cos t$, $\tan t$, $\csc t$, $\sec t$, and $\cot t$.

9. If $\tan t = \dfrac{1}{4}$ and t has terminal side in quadrant III, find $\sin t$ and $\cos t$.

10. If $\sec t = 3$ and t has terminal side in quadrant IV, find $\sin t$ and $\cos t$.

11. Use the trig identities to write each expression in terms of a single trig function or a constant.

(a) $\tan t \cos t$

(b) $\dfrac{\csc t}{\cot t}$

(c) $\tan t - \dfrac{\sec^2 t}{\tan t}$

(d) $\dfrac{1 - \cos^2 t}{\tan^2 t}$

(e) $\dfrac{\tan t + \cot t}{\tan t}$

(f) $\sin^2 t \left(1 + \cot^2 t\right)$