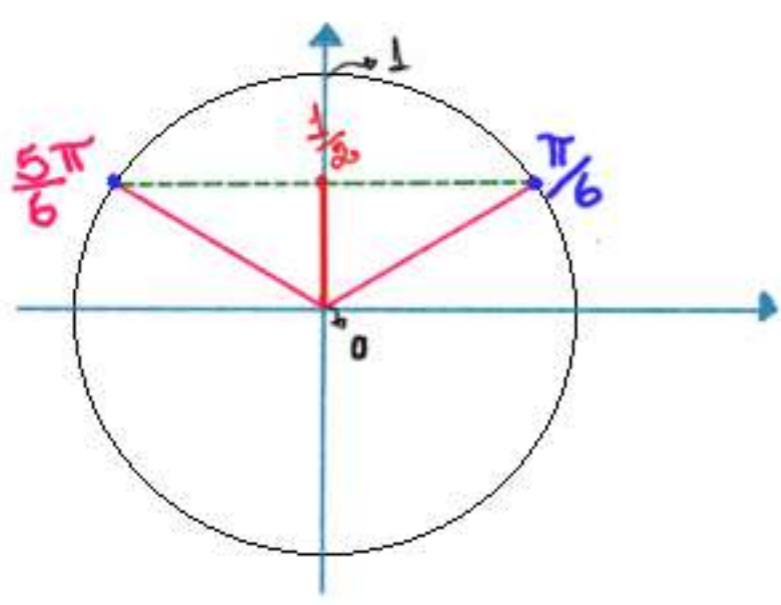


Resolva as inequações para $0 \leq x < 2\pi$.

1. $\text{sen } x \geq \frac{1}{2}$



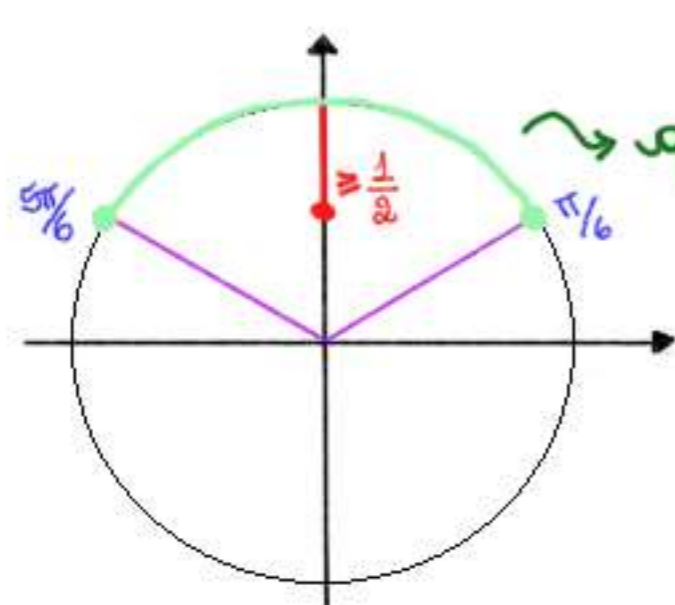
Se $\text{sen } x = \frac{1}{2}$, temos que $\text{sen } 30^\circ$ em radianos será:

$$\begin{array}{l} 360^\circ \longrightarrow 2\pi \text{ rad} \\ 30^\circ \longrightarrow x \\ x = \frac{\pi}{6} \text{ rad} \end{array}$$

Do outro lado:

$$\begin{array}{l} 360^\circ \longrightarrow 2\pi \text{ rad} \\ (180^\circ - 30^\circ) \longrightarrow x \\ x = \frac{5\pi}{6} \text{ rad} \end{array}$$

• Mas, $\text{sen } x \geq \frac{1}{2}$

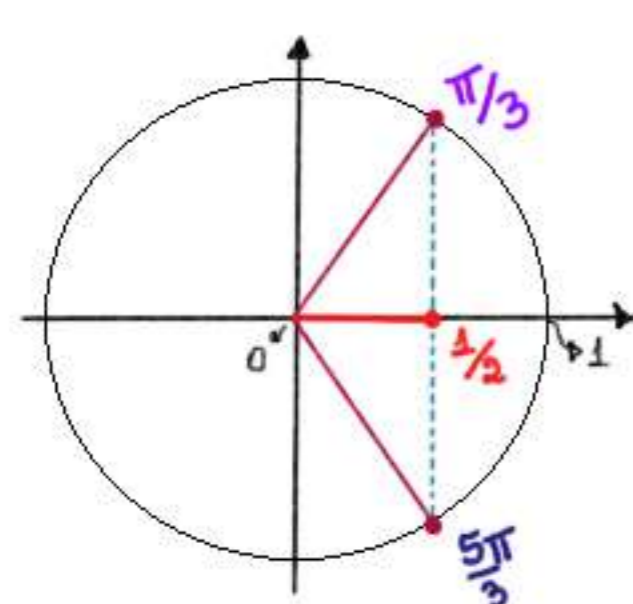


queremos estes valores, inclusive, e $\text{sen } x = \frac{1}{2}$

Então:

$$S = \{x \in \mathbb{R} / \pi/6 \leq x \leq 5\pi/6\}$$

2. $\text{cos } x < \frac{1}{2}$



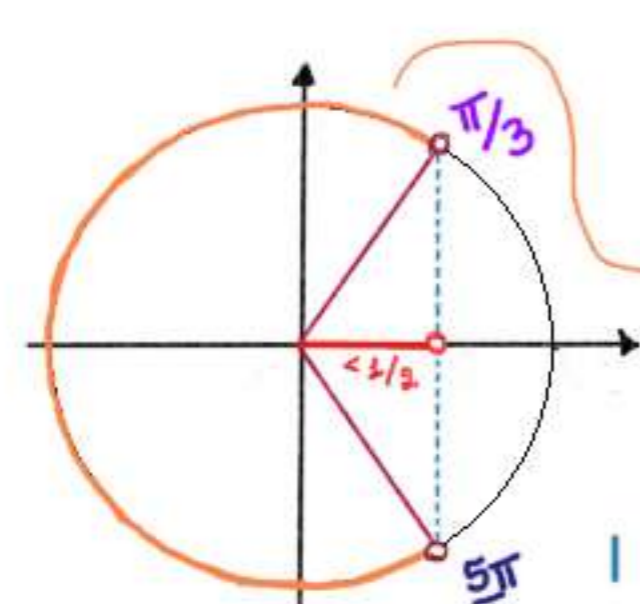
Se $\text{cos } x = \frac{1}{2}$ temos $\text{cos } 60^\circ$ em rad:

$$\begin{array}{l} 360^\circ \longrightarrow 2\pi \text{ rad} \\ 60^\circ \longrightarrow x \\ x = \frac{\pi}{3} \text{ rad} \end{array}$$

Como temos 1 volta:

$$\begin{array}{l} 2\pi - \frac{\pi}{3} \\ \frac{6\pi - \pi}{3} = \frac{5\pi}{3} \end{array}$$

• Mas temos $\text{cos } x < \frac{1}{2}$

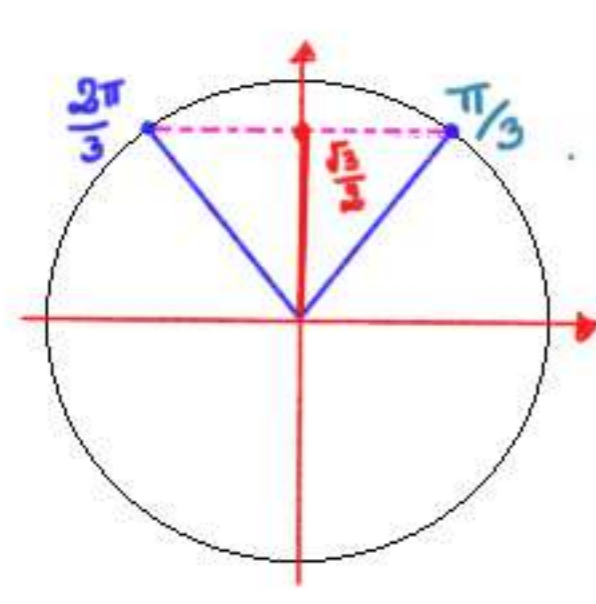


queremos estes valores, mas não $\text{cos } x = \frac{1}{2}$

Então:

$$S = \{x \in \mathbb{R} / \pi/3 < x < 5\pi/3\}$$

3. $\text{sen } x < \frac{\sqrt{3}}{2}$



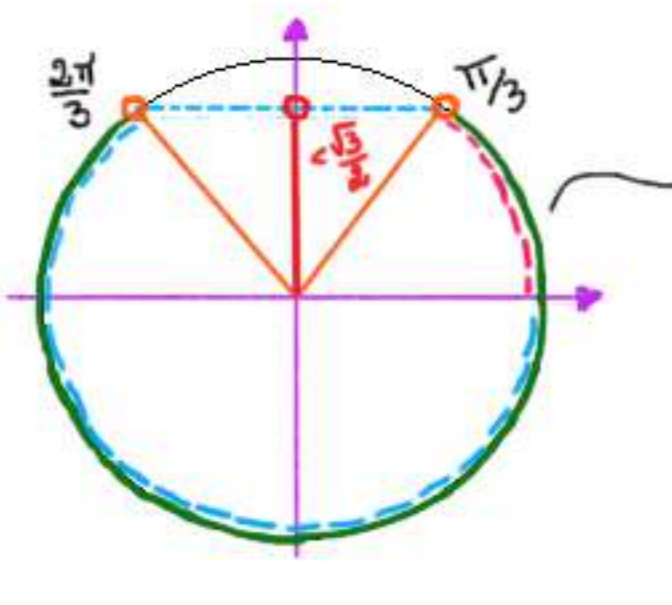
Se $\text{sen } x = \frac{\sqrt{3}}{2}$ então temos $\text{sen } 60^\circ$

em rad:

$$\begin{array}{l} 360^\circ \longrightarrow 2\pi \text{ rad} \\ 60^\circ \longrightarrow x \\ x = \frac{\pi}{3} \end{array}$$

Do outro lado:

$$\begin{array}{l} \pi - \frac{\pi}{3} \\ \frac{3\pi - \pi}{3} \rightarrow \frac{2\pi}{3} \end{array}$$



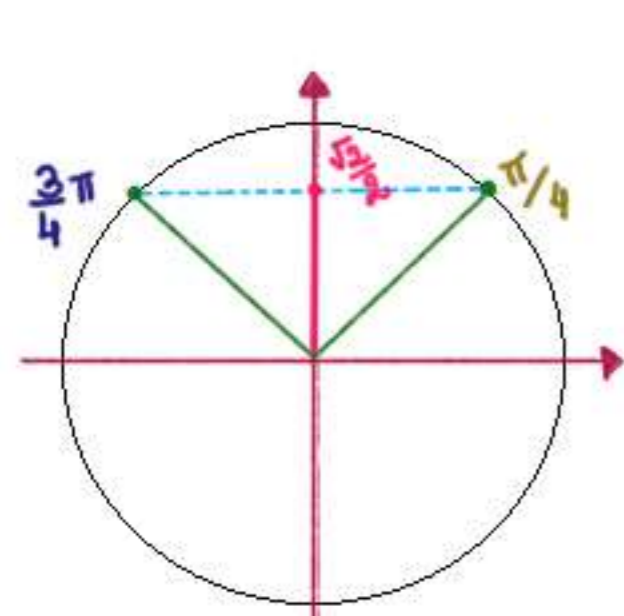
queremos estes valores, mas não $\text{sen } x = \frac{\sqrt{3}}{2}$

Então, temos 2 intervalos:

$$0 \leq x < \frac{\pi}{3} \quad \text{ou} \quad \frac{2\pi}{3} < x \leq 2\pi$$

$$S = \{x \in \mathbb{R} / 0 \leq x < \pi/3 \text{ ou } 2\pi/3 < x \leq 2\pi\}$$

4. $\text{sen } x > \frac{\sqrt{2}}{2}$



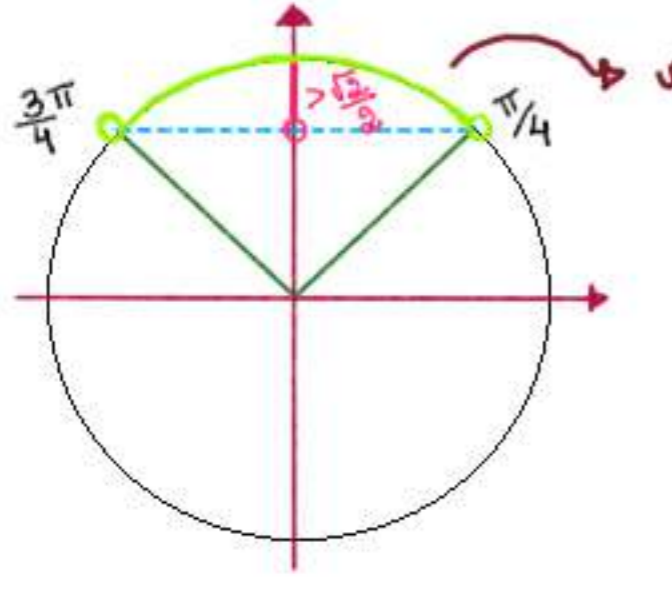
Se $\text{sen } x = \frac{\sqrt{2}}{2}$, temos $\text{sen } 45^\circ$ e em rad.:

$$\begin{array}{l} 360^\circ \longrightarrow 2\pi \text{ rad} \\ 45^\circ \longrightarrow x \\ x = \frac{\pi}{4} \end{array}$$

Do outro lado:

$$\begin{array}{l} \pi - \frac{\pi}{4} \\ \frac{4\pi - \pi}{4} \rightarrow \frac{3\pi}{4} \end{array}$$

• Mas $\text{sen } x > \frac{\sqrt{2}}{2}$

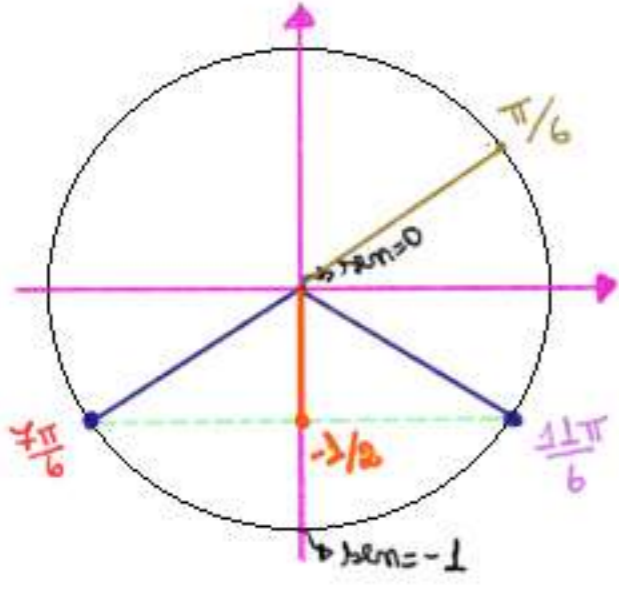


queremos estes valores, mas não $\text{sen } x = \frac{\sqrt{2}}{2}$

Então:

$$S = \{x \in \mathbb{R} / \pi/4 < x < 3\pi/4\}$$

5. $\text{sen } x \leq -\frac{1}{2}$



Se $\text{sen } x = -\frac{1}{2}$, temos $\text{sen } 210^\circ$ ($180^\circ + 30^\circ$),

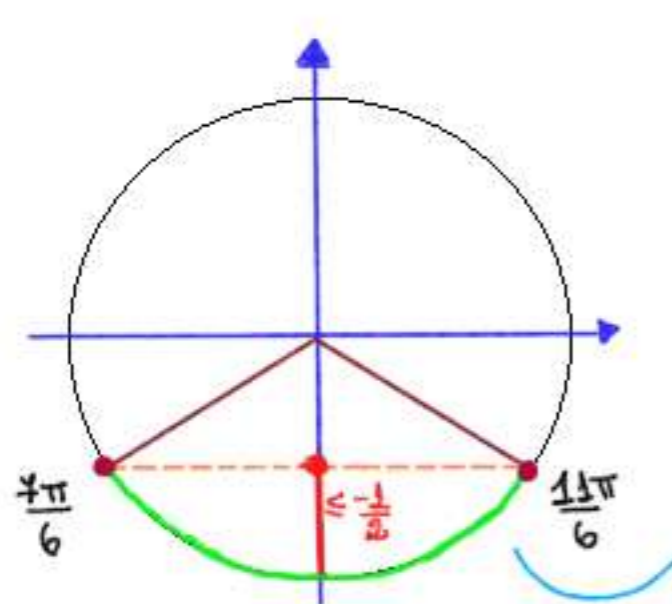
em rad:

$$\begin{array}{l} 360^\circ \longrightarrow 2\pi \text{ rad} \\ 210^\circ \longrightarrow x \\ x = \frac{7\pi}{6} \end{array}$$

Do outro lado:

$$\begin{array}{l} 2\pi - \frac{\pi}{6} \\ \frac{12\pi - \pi}{6} \rightarrow \frac{11\pi}{6} \end{array}$$

• Mas, $\text{sen } x \leq -\frac{1}{2}$

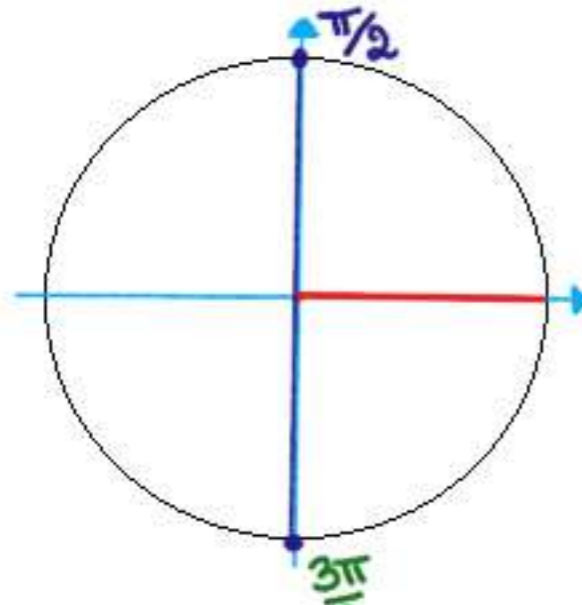


queremos estes valores, inclusive $\text{sen } x = -\frac{1}{2}$

Então:

$$S = \{x \in \mathbb{R} / 7\pi/6 \leq x \leq 11\pi/6\}$$

6. $\text{cos } x \geq 0$

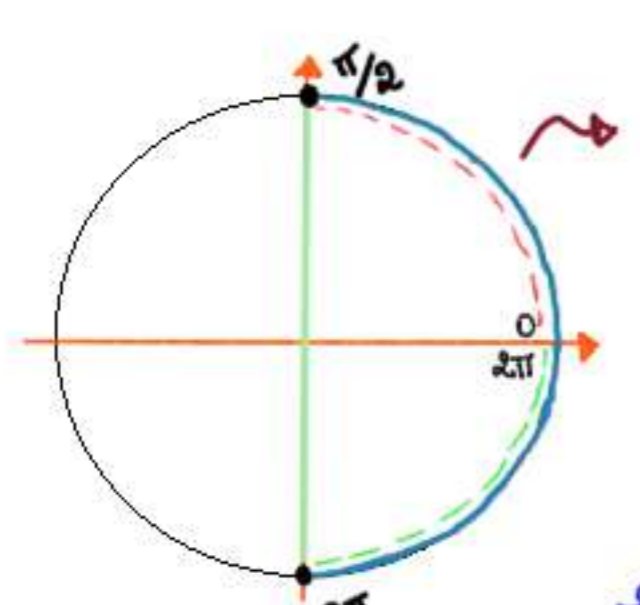


Se $\text{cos } x = 0$, temos $\text{cos } 90^\circ$ em radianos valores que é $\frac{\pi}{2}$

Do outro lado:

$$\begin{array}{l} 2\pi - \frac{\pi}{2} \\ \frac{4\pi - \pi}{2} \rightarrow \frac{3\pi}{2} \end{array}$$

• Queremos $\text{cos } x \geq 0$



queremos estes valores, inclusive $\text{cos } x = 0$

Temos 2 intervalos:

$$0 \leq x \leq \pi/2 \quad \text{ou} \quad 3\pi/2 \leq x \leq 2\pi$$

Então:

$$S = \{x \in \mathbb{R} / 0 \leq x \leq \pi/2 \text{ ou } 3\pi/2 \leq x \leq 2\pi\}$$