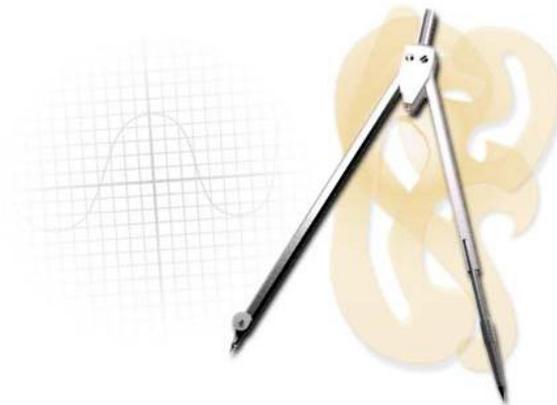


# Единичная окружность



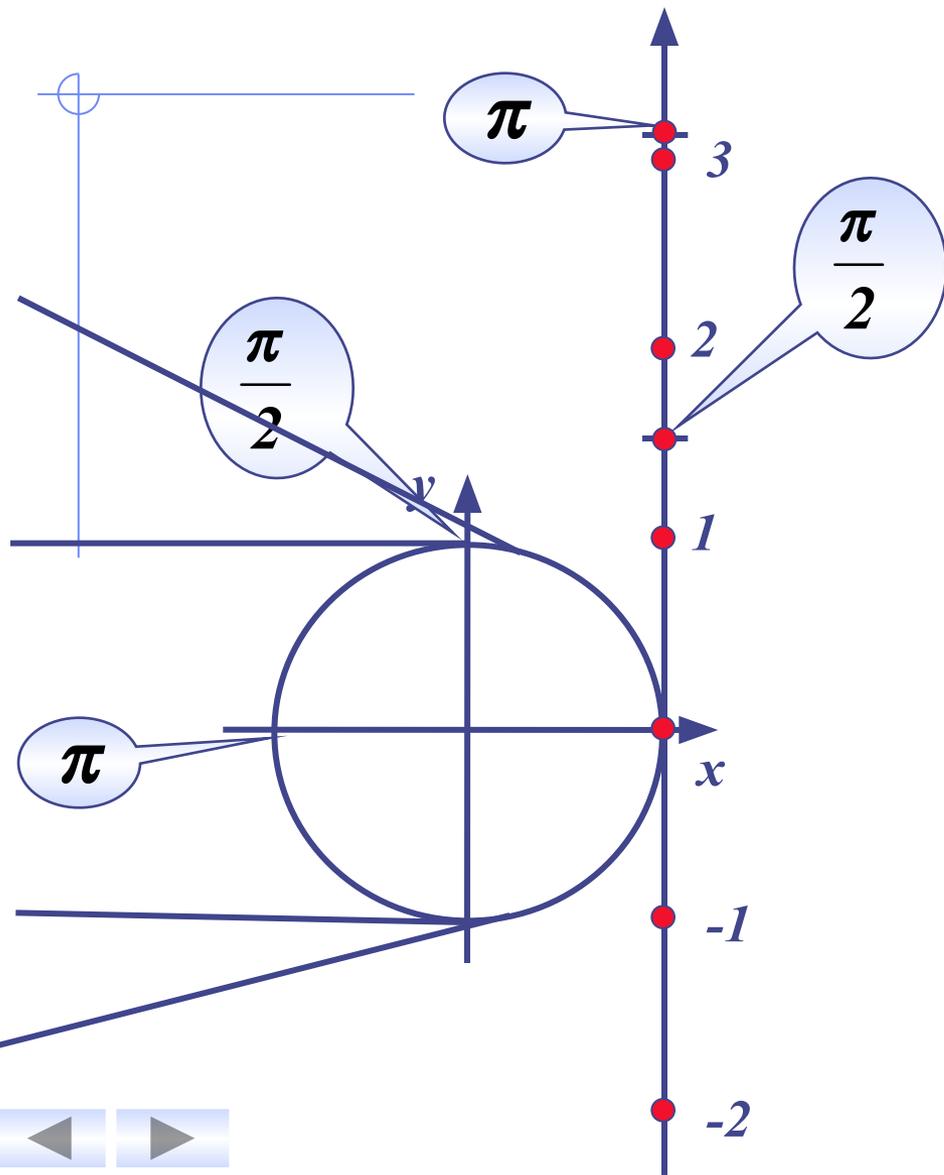
# Содержание

- Числовая окружность
- Поворот точки вокруг начала координат
- Поворот точки на  $360^\circ$
- Поворот точки на  $180^\circ$
- Поворот точки на  $90^\circ$
- Поворот точки на  $270^\circ$
- Поворот точки на  $30^\circ$
- Поворот точки на  $45^\circ$
- Поворот точки на  $60^\circ$
- Поворот точки на  $810^\circ$
- Упражнение № 235



**ВЫХОД**

# Числовая окружность

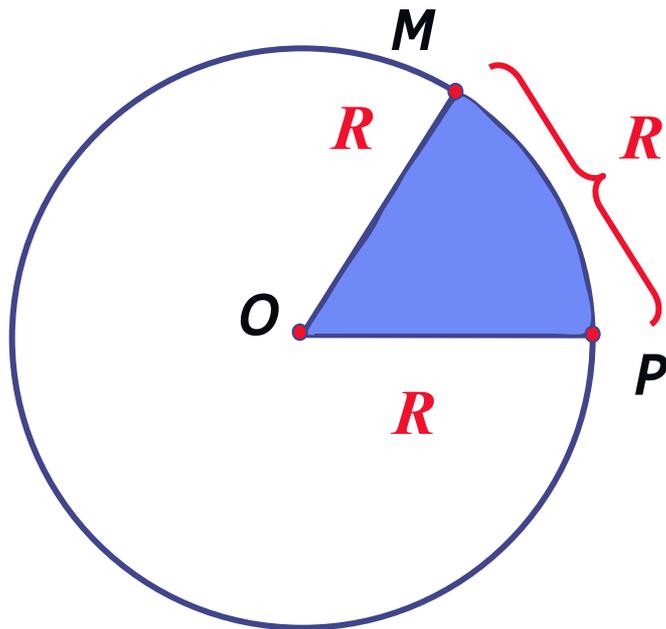


$$\pi \approx 3,14\dots$$

$$1^\circ = \frac{\pi}{180} \text{ рад}$$

$$1 \text{ рад} = \left( \frac{180}{\pi} \right)^\square$$

# Угол в один радиан



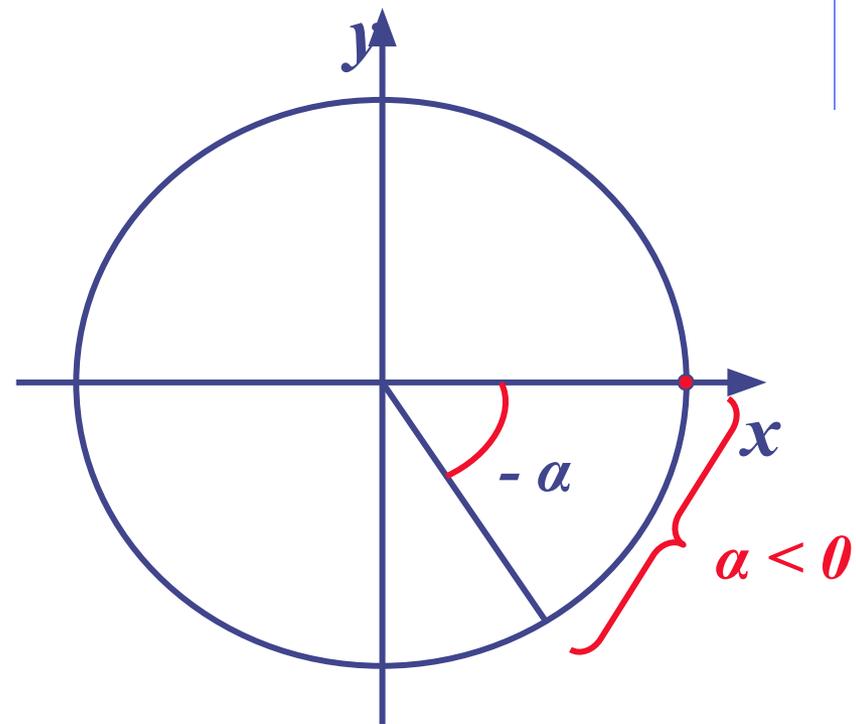
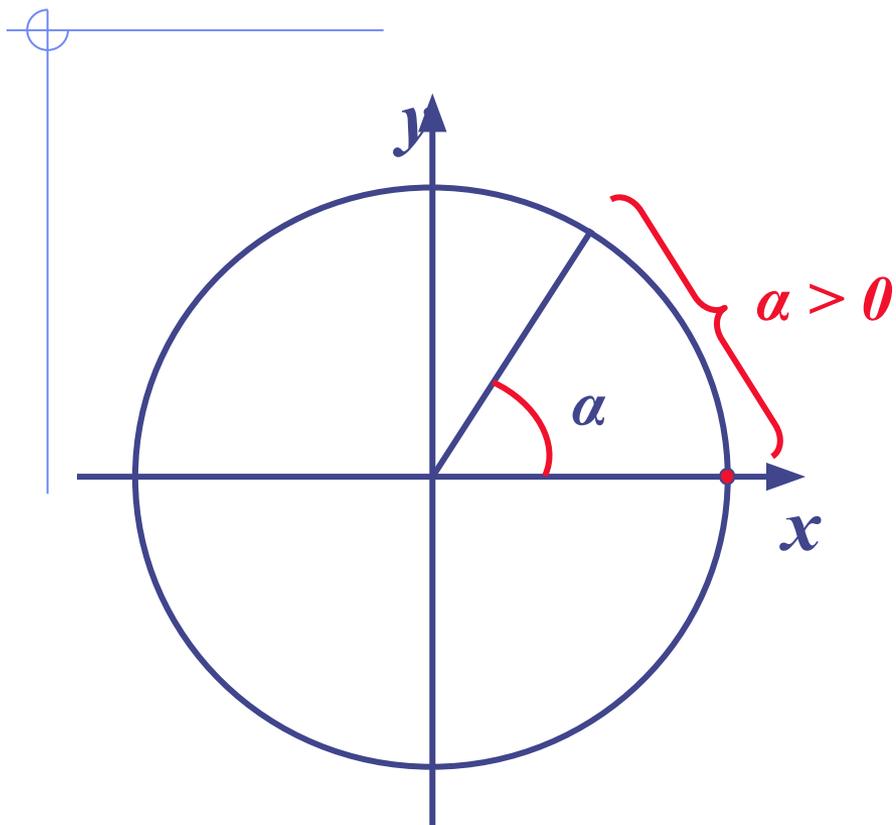
$$\angle POM = 1 \text{ рад}$$

$$1 \text{ рад} = \left( \frac{180}{\pi} \right)^\square$$

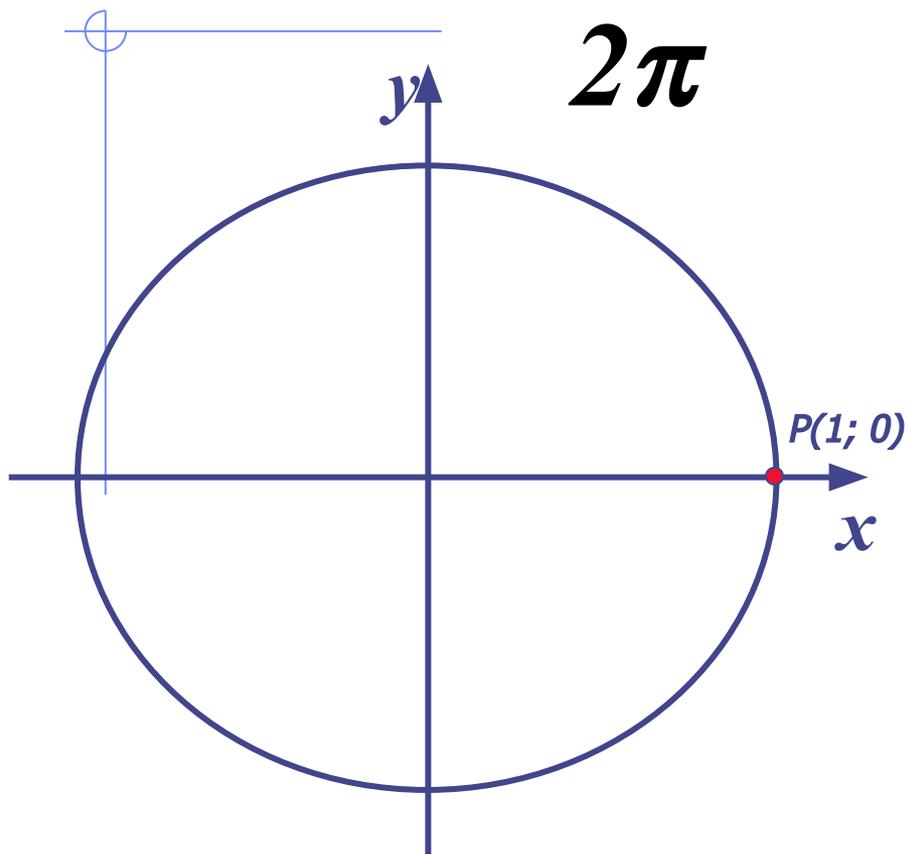
$$1 \text{ рад} \approx 57,3^\circ$$



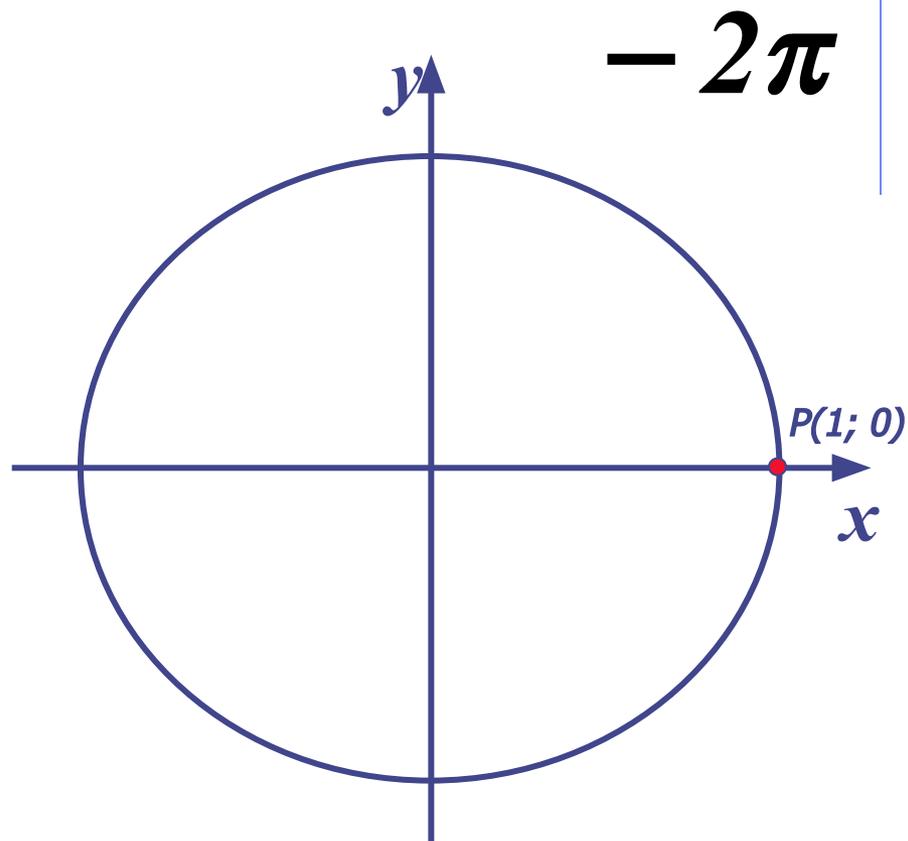
# Поворот точки



# Поворот точки на угол



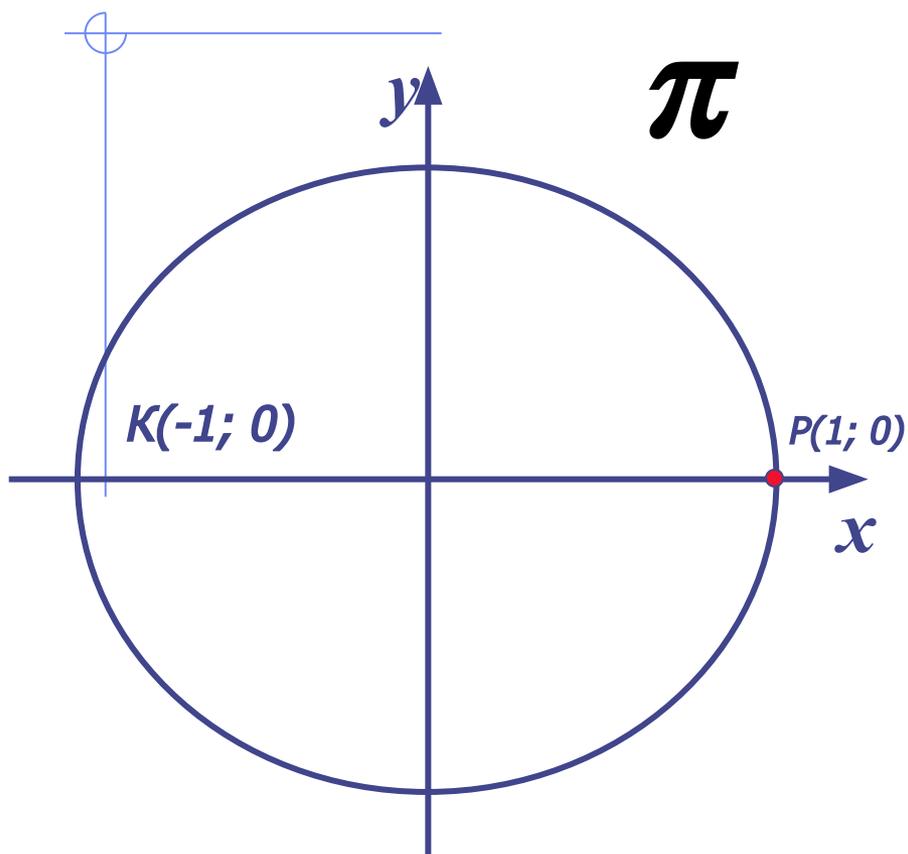
$$2\pi = 360^\circ$$



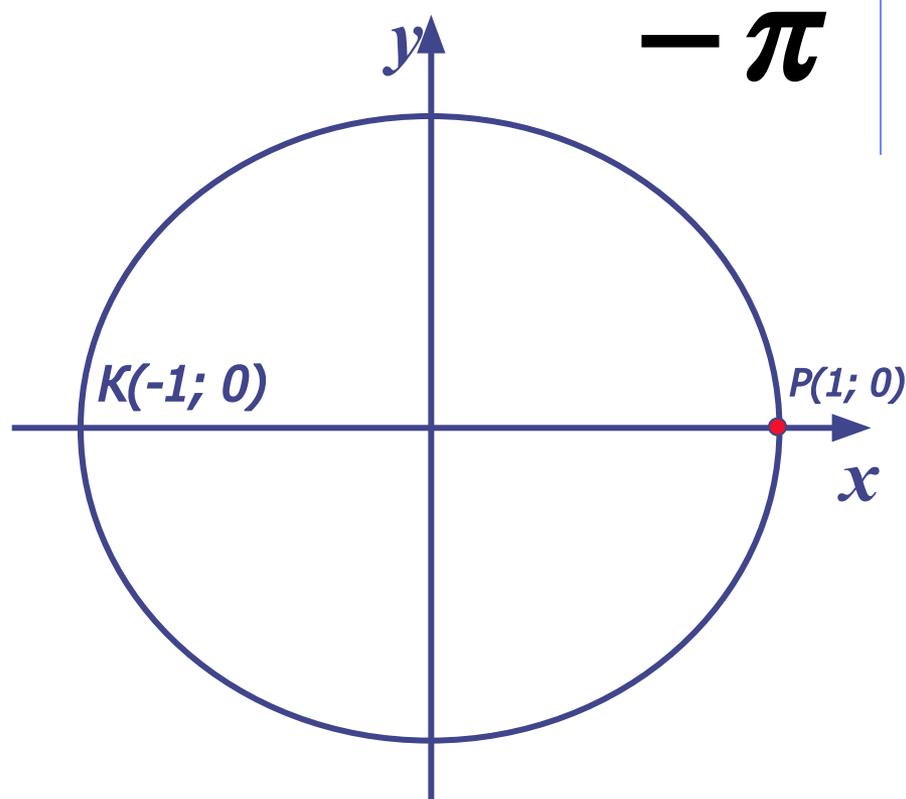
$$-2\pi = -360^\circ$$



# Поворот точки на угол



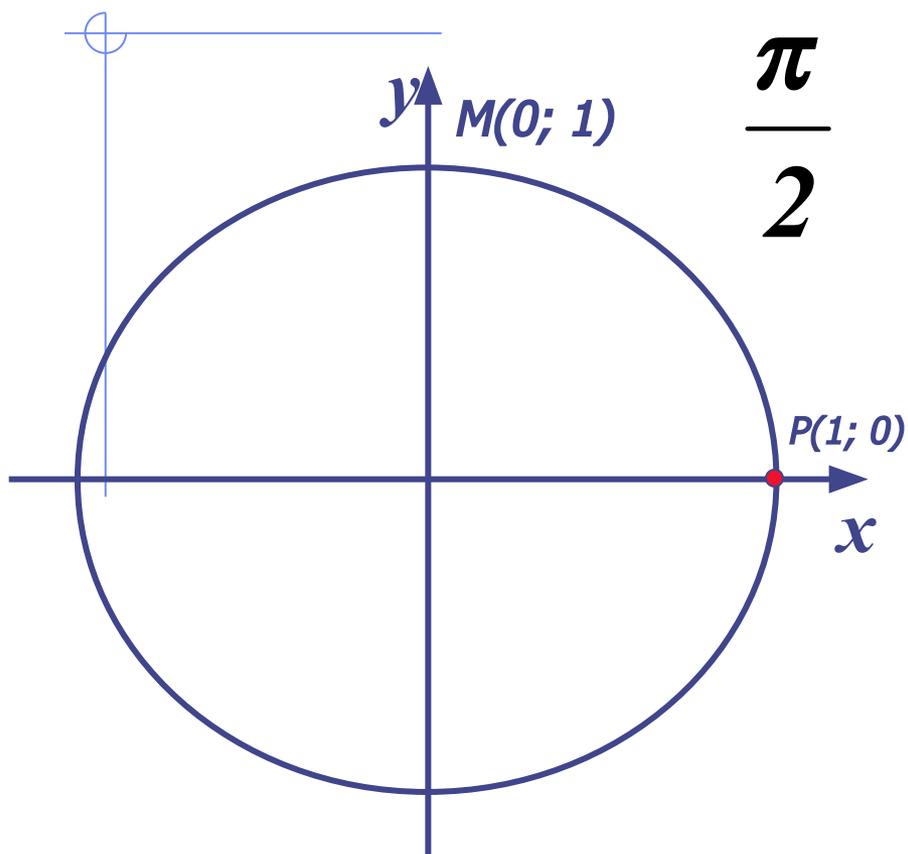
$$\pi = 180^\circ$$



$$-\pi = -180^\circ$$

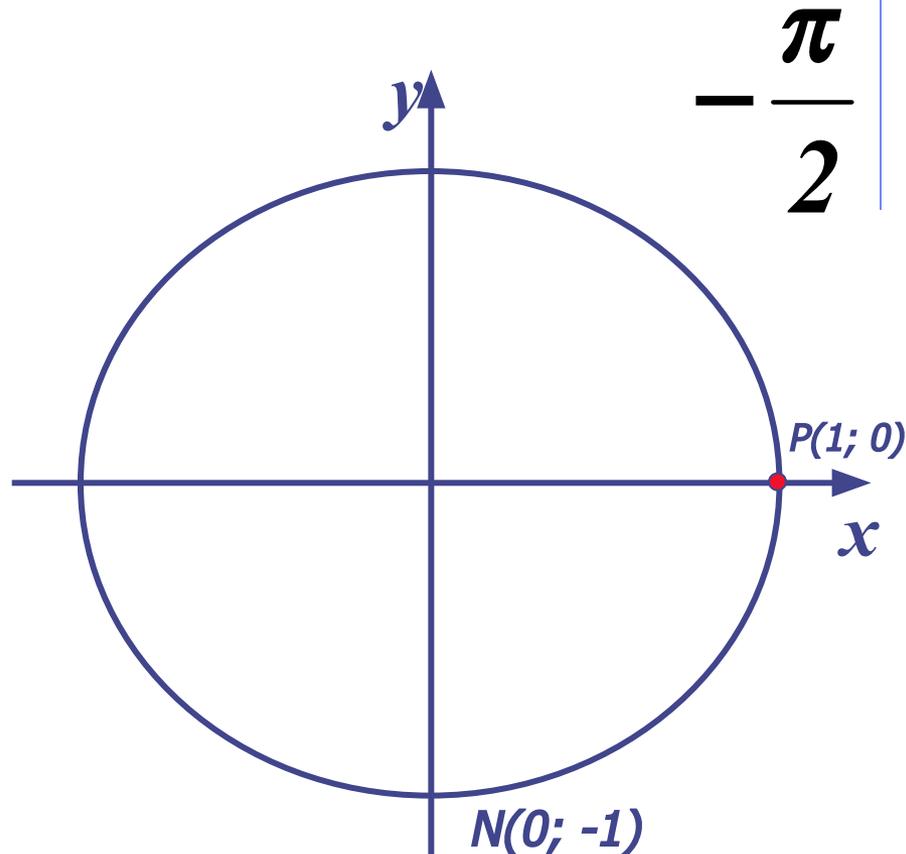


# Поворот точки на угол



$$\frac{\pi}{2}$$

$$\frac{\pi}{2} = 90^\circ$$

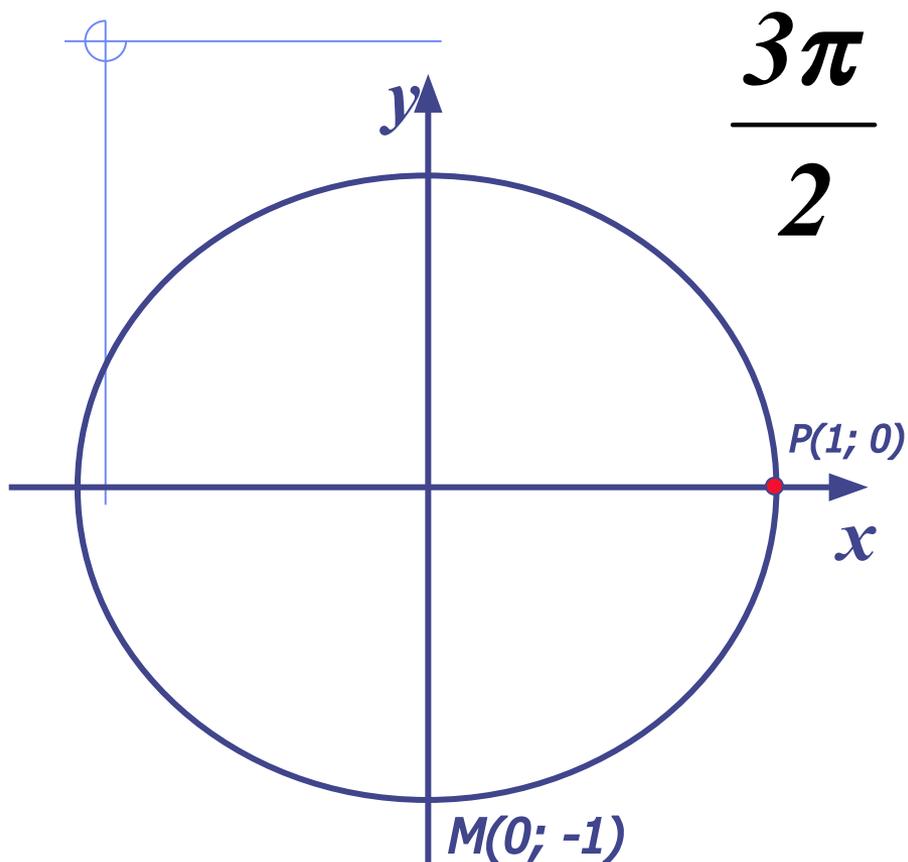


$$-\frac{\pi}{2}$$

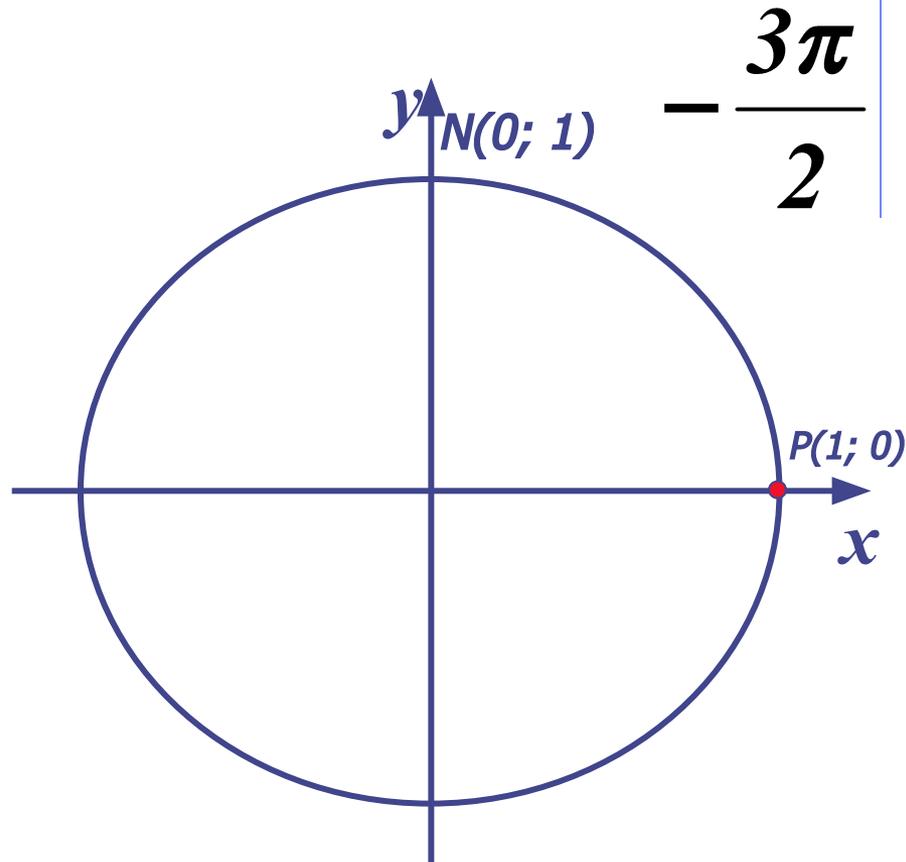
$$-\frac{\pi}{2} = -90^\circ$$



# Поворот точки на угол



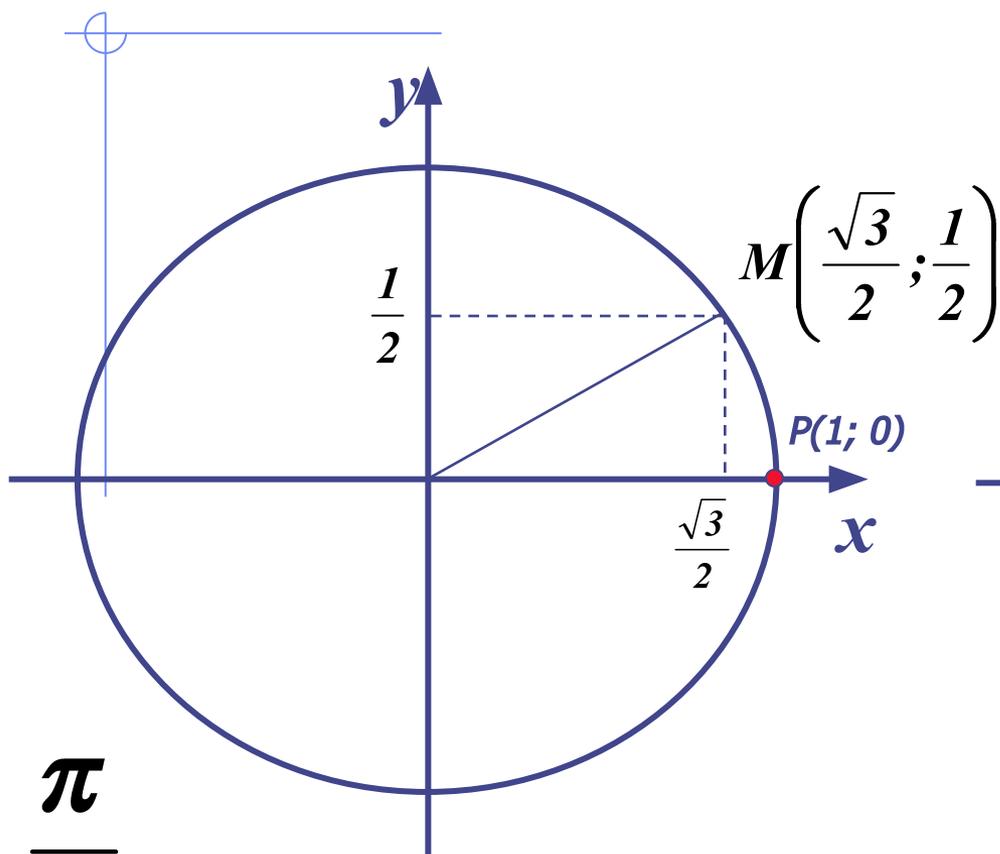
$$\frac{3\pi}{2} = 270^\circ$$



$$-\frac{3\pi}{2} = -270^\circ$$

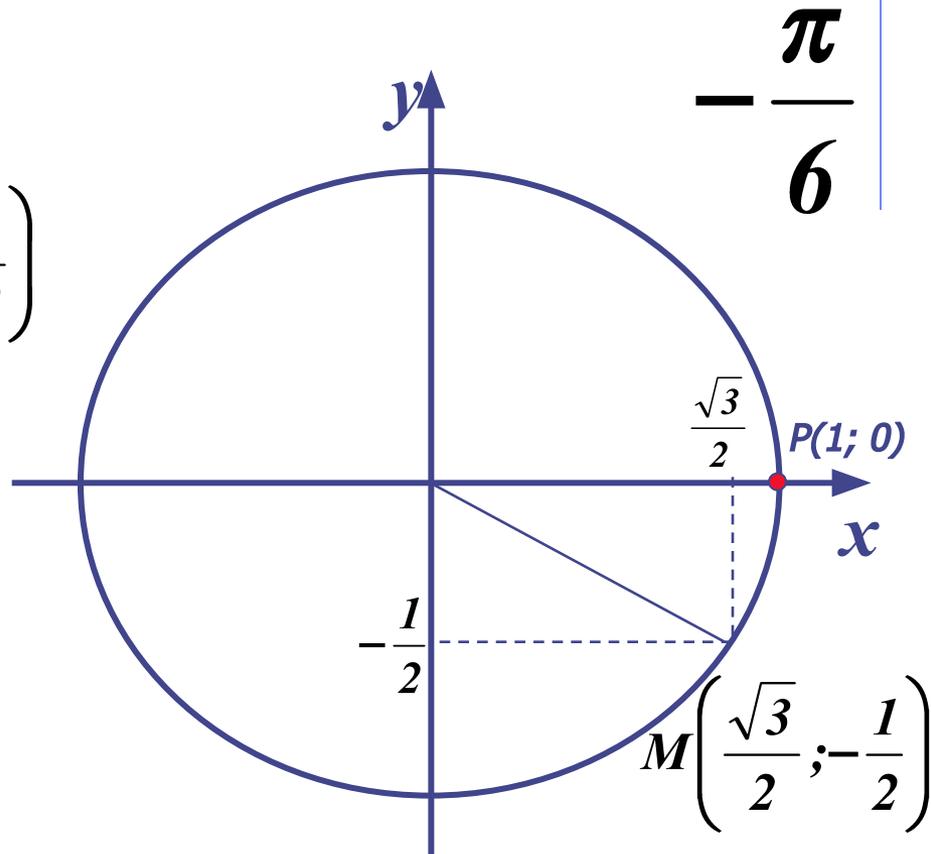


# Поворот точки на угол



$$\frac{\pi}{6}$$

$$\frac{\pi}{6} = 30^\circ$$

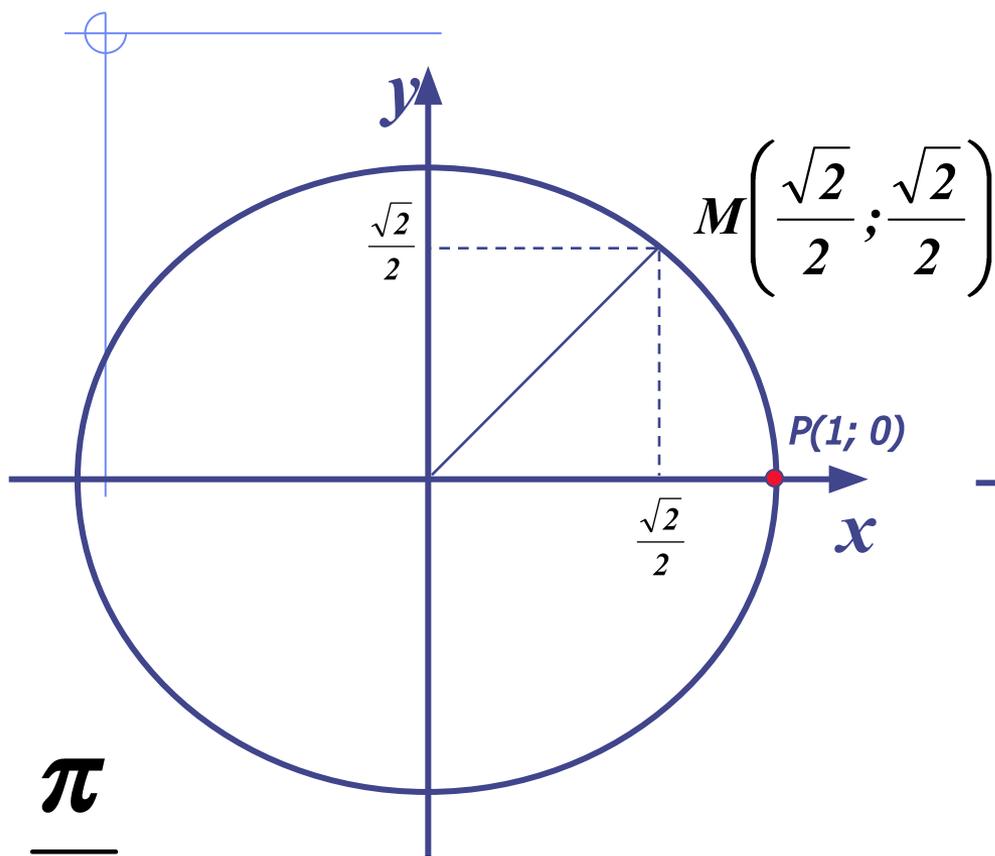


$$-\frac{\pi}{6}$$

$$-\frac{\pi}{6} = -30^\circ$$

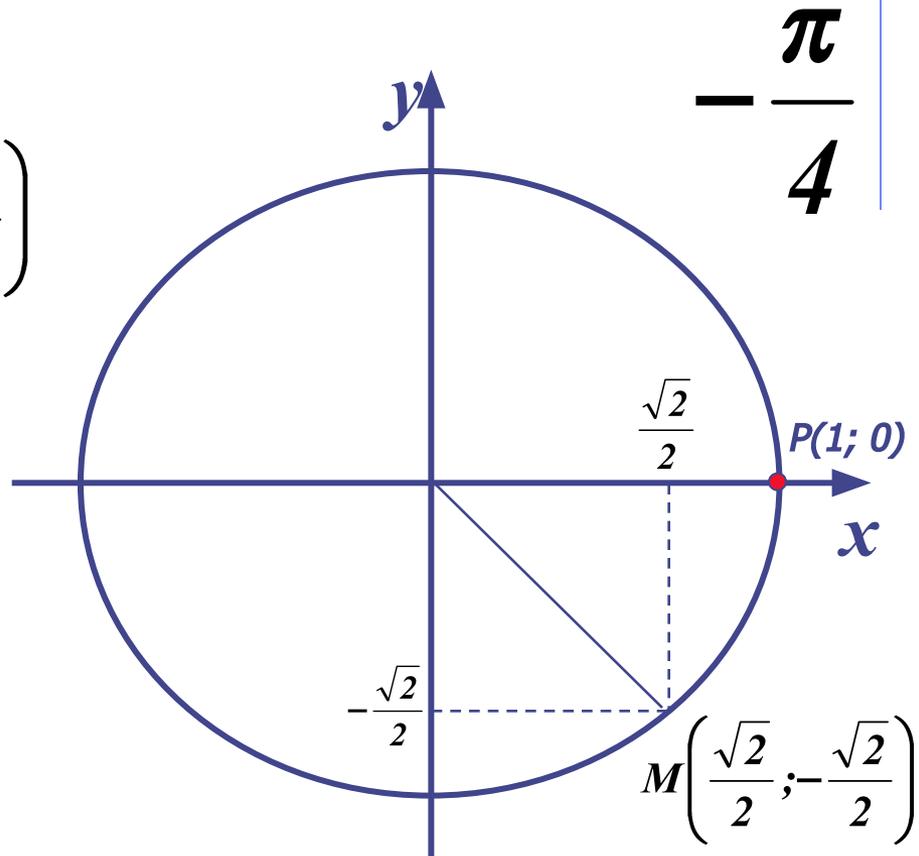


# Поворот точки на угол



$$\frac{\pi}{4}$$

$$\frac{\pi}{4} = 45^\circ$$

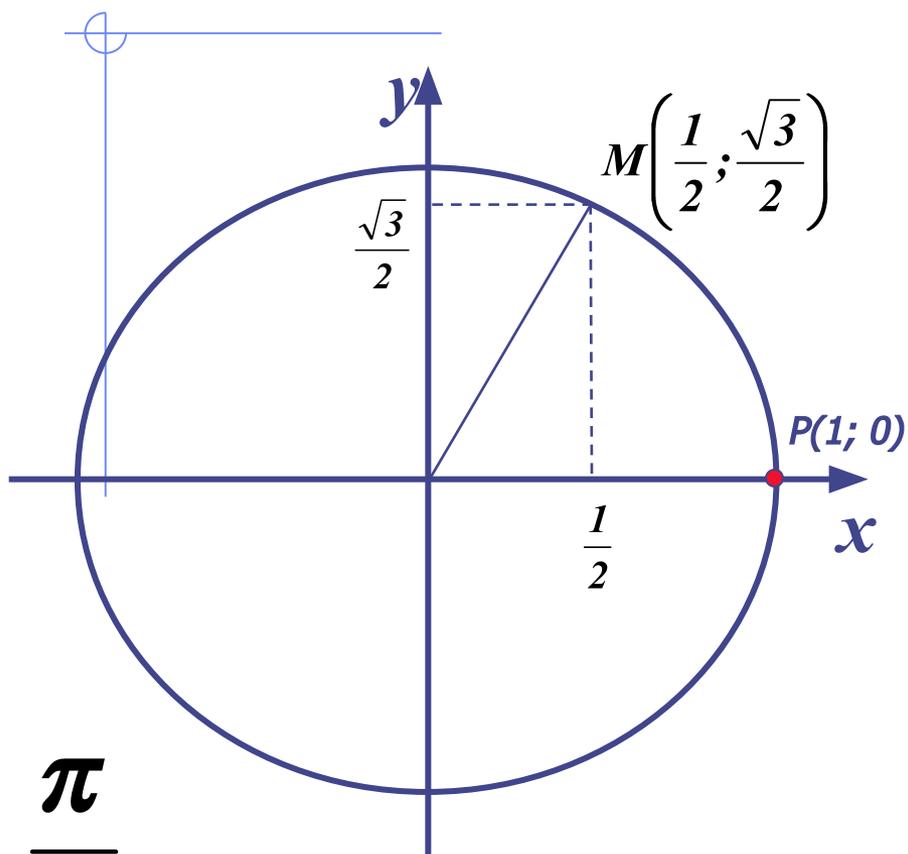


$$-\frac{\pi}{4}$$

$$-\frac{\pi}{4} = -45^\circ$$

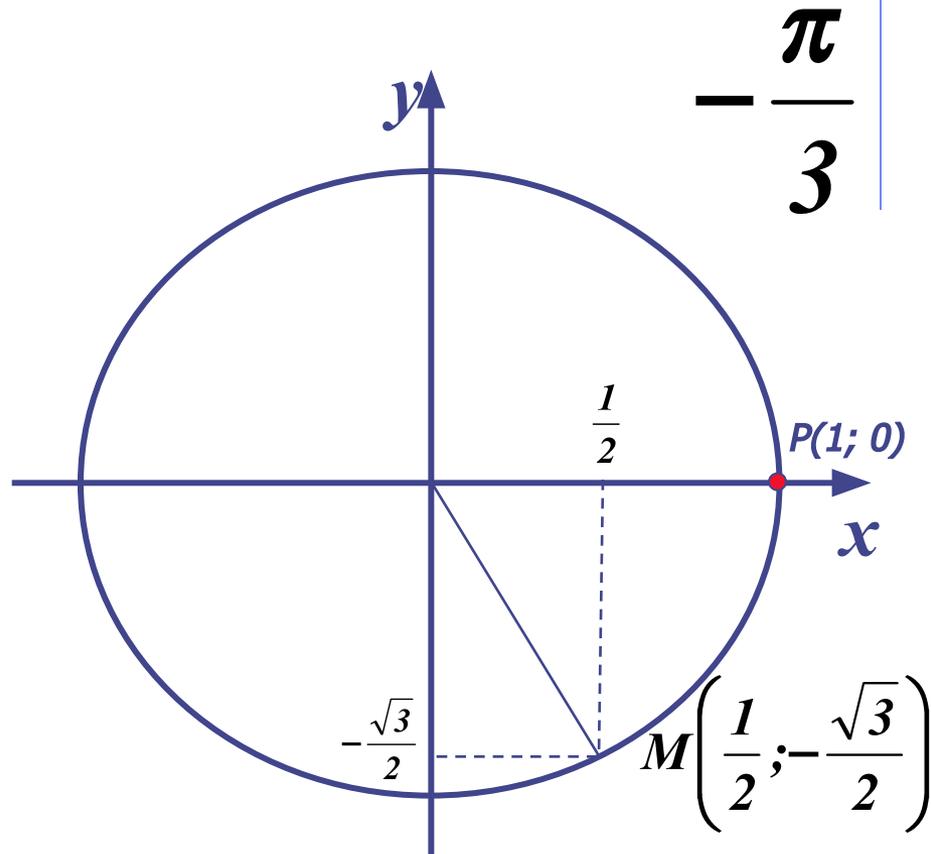


# Поворот точки на угол



$$\frac{\pi}{3}$$

$$\frac{\pi}{3} = 60^\circ$$

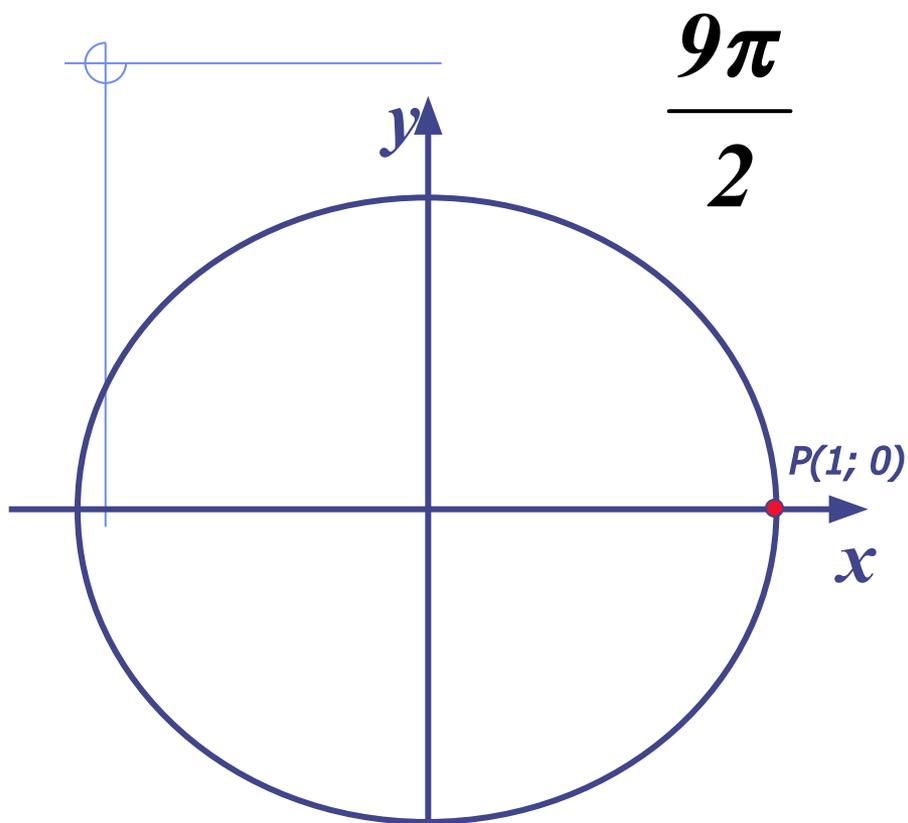


$$-\frac{\pi}{3}$$

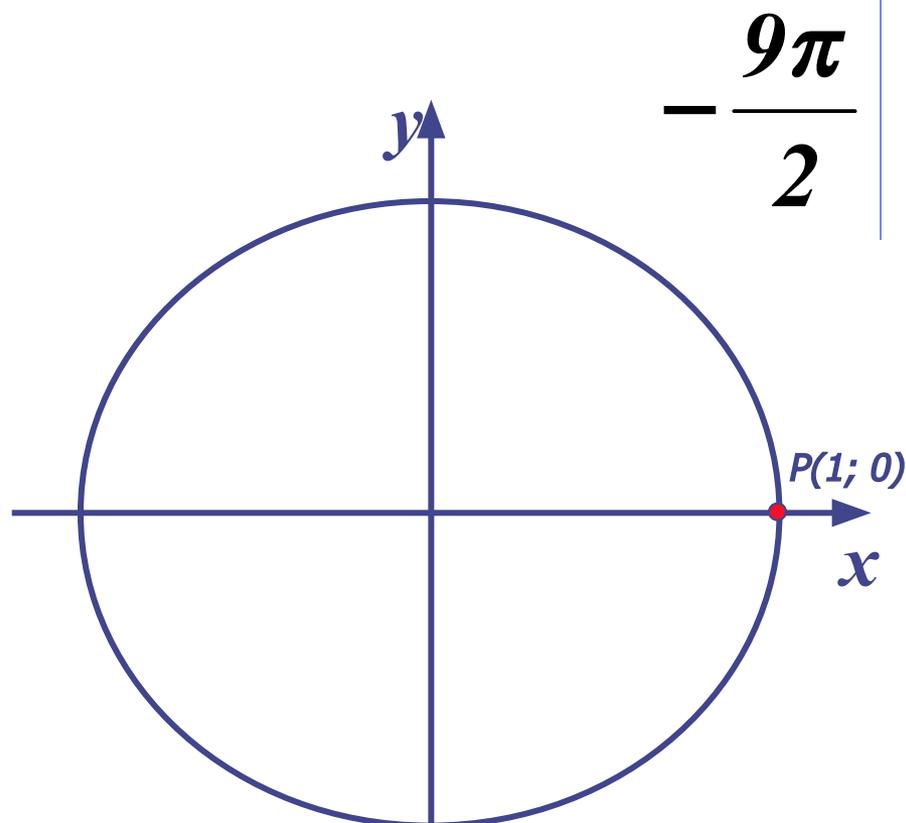
$$-\frac{\pi}{3} = -60^\circ$$



# Поворот точки на угол



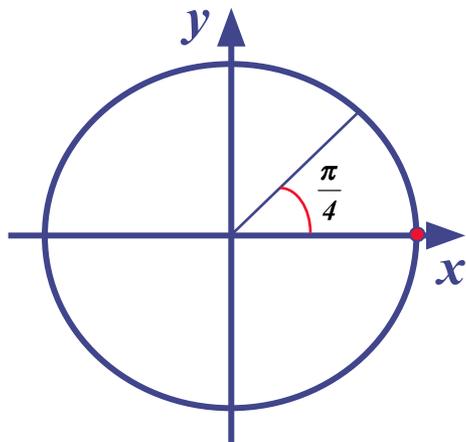
$$\frac{9\pi}{2} = 2 \cdot 2\pi + \frac{\pi}{2}$$



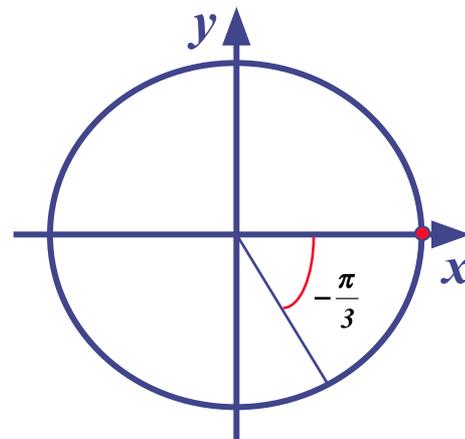
$$-\frac{9\pi}{2} = -2 \cdot 2\pi - \frac{\pi}{2}$$



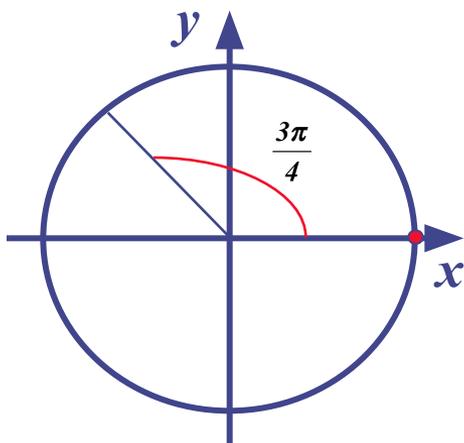
$$\frac{\pi}{4}$$



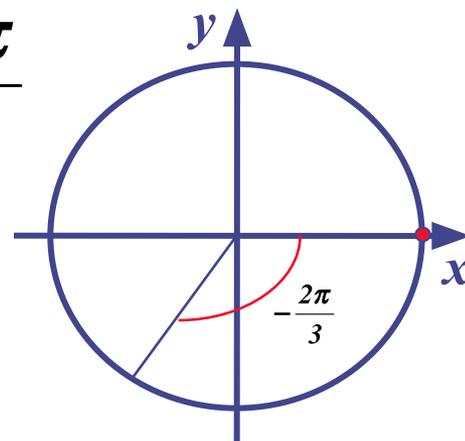
$$-\frac{\pi}{3}$$



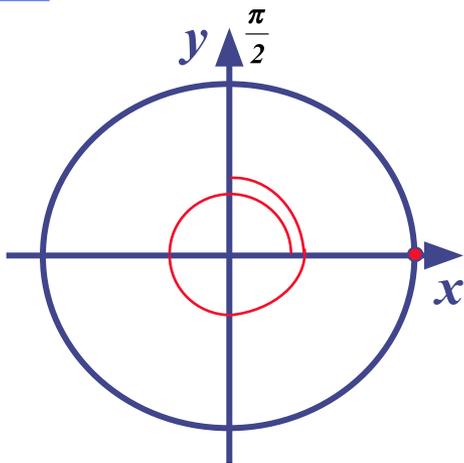
$$\frac{3\pi}{4}$$



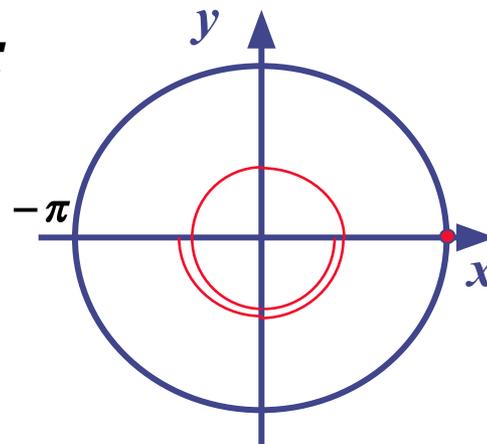
$$-\frac{2\pi}{3}$$



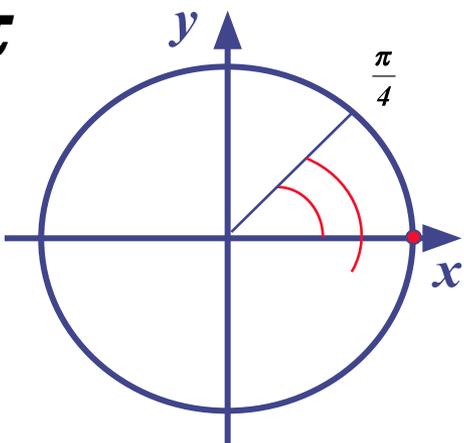
$$\frac{\pi}{2} + 2\pi$$



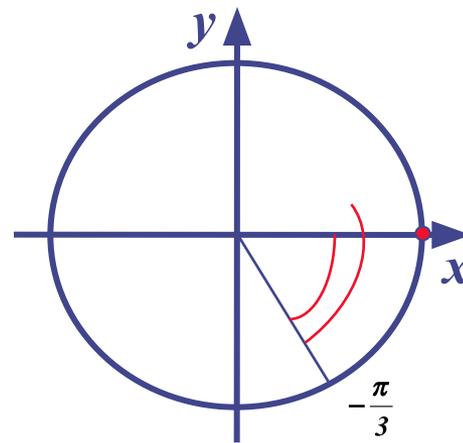
$$-\pi - 2\pi$$



$$\frac{\pi}{4} - 4\pi$$



$$-\frac{\pi}{3} + 6\pi$$



# *Список литературы*

- *Алгебра: учебник для 9 кл./Ш.А.Алимов/М., Просвещение, 2006*
- *Изучение алгебры 7-9, Ю.М.Колягин, М., Просвещение, 2002*

