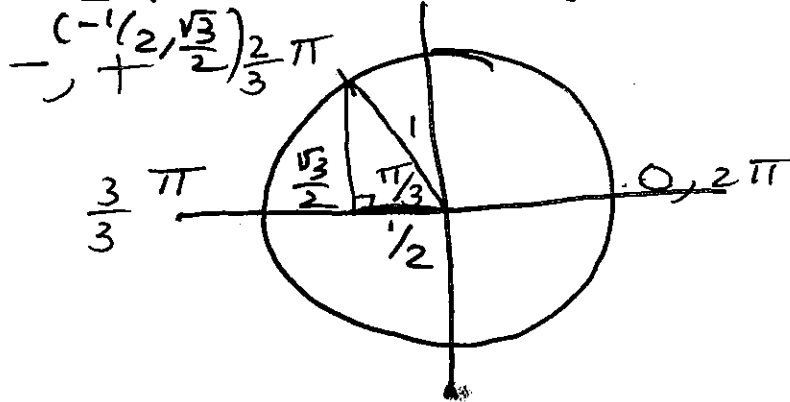


EXAMPLE Find the exact value.

① $\cos \frac{2}{3}\pi$

SOL

- Step 1: Find $\frac{2}{3}\pi$ on the unit circle



- Step 2 Find the reference angle

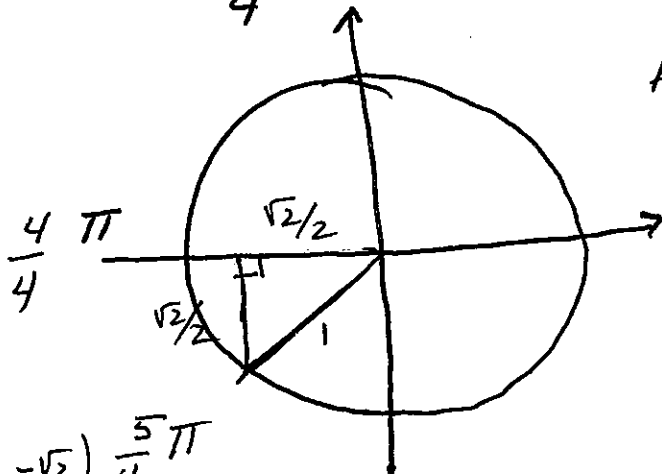
$$\theta_R = \frac{\pi}{3}$$

- Step 3 Label the triangle.

- Step 4: Label x & y coord

- Step 5: cosine equals x-coord
 $\cos(\frac{2}{3}\pi) = -\frac{1}{2}$

② $\sin \frac{5}{4}\pi$



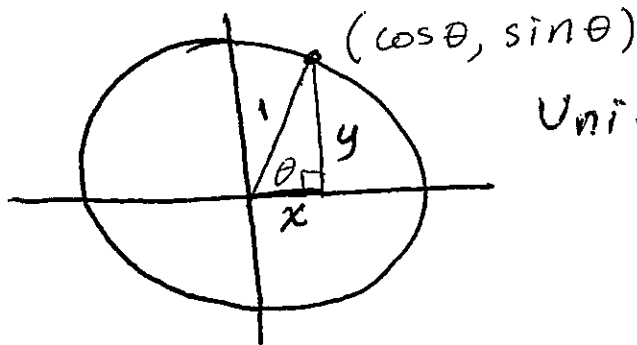
Answer $-\frac{\sqrt{2}}{2}$

$(-\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2})$ $\frac{5}{4}\pi$
 \swarrow $\sin \frac{5}{4}\pi$

The Fundamental Identity

(Pythagorean Identity)

$$\cos^2 \theta + \sin^2 \theta = 1$$



Unit circle
 $x^2 + y^2 = 1^2$

EXAMPLE Find $\cos \alpha$, given that $\sin \alpha = 3/5$
and α lies in quadrant II.

SOLUTION

$$\cos^2 \alpha + \sin^2 \alpha = 1$$

$$\cos^2(\alpha) + (3/5)^2 = 1$$

$$\cos^2 \alpha + \frac{9}{25} = 1$$

$$\cos^2 \alpha = 1 - \frac{9}{25}$$

$$\cos^2 \alpha = \frac{25}{25} - \frac{9}{25} = \frac{16}{25}$$

$$\cos \alpha = -\sqrt{\frac{16}{25}} = -\frac{4}{5}$$

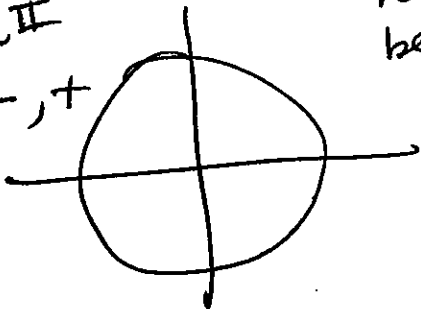
↑
neg
because Quad 2

Note:

- $\cos^2 \alpha$ means $(\cos \alpha)^2$
- $\cos \alpha^2$ means $\cos(\alpha^2)$

QII

-, +



§4.4 #45 Solve

$$(\log(z))^2 = \log(z^2)$$

$$(\log(z))^2 = 2 \log(z)$$

Let $u = \log z$.

$$u^2 = 2u$$

$$u^2 - 2u = 0$$

$$u(u-2) = 0$$

$$u = 0, u = 2$$

$$\log z = 0, \log z = 2$$

Write as an exponent.

$$10^0 = z, 10^2 = z$$

$$z = 1, z = 100$$