

Lesson 9 Using the Special Circle

Ex. 1) Determine the exact values of the following

unit circle
 $(x, y) \rightarrow (\cos \theta, \sin \theta)$

a) $\cos \frac{\pi}{3}$

$\frac{1}{2}$

b) $\sec \frac{\pi}{4}$ reciprocal of $\cos \frac{\pi}{4}$

$\frac{2}{\sqrt{2}}$ $\left(\frac{\sqrt{2}}{\sqrt{2}}\right)$ $\frac{\sqrt{2}}{\sqrt{2}}$ $\sqrt{2}$

c) $\csc\left(-\frac{2\pi}{3}\right)$

$-\frac{2}{\sqrt{3}}$ $\left(\frac{\sqrt{3}}{\sqrt{3}}\right)$ $-\frac{2\sqrt{3}}{3}$

d) $\cot \frac{5\pi}{6}$

$-\sqrt{3}$

e) $\cos \frac{29\pi}{6}$

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

f) $\cos(30\pi) \cdot \sec \frac{2\pi}{3} \cdot \csc \frac{-\pi}{3}$

$1 (-2) \left(-\frac{2}{\sqrt{3}}\right)$

$\frac{4}{\sqrt{3}}$

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Ex. 2) State the values of θ over the interval $0 \leq \theta \leq 2\pi$.

a) $\cos\theta = \frac{1}{\sqrt{2}} \left(\frac{\sqrt{2}}{\sqrt{2}} \right)$

radians
so answers in radians

$$\cos\theta = \frac{\sqrt{2}}{2}$$

$$\theta = \frac{\pi}{4}, \frac{7\pi}{4}$$

b) $\tan\theta = -\frac{1}{\sqrt{3}}$

$$\theta = \frac{5\pi}{6}, \frac{11\pi}{6}$$

c) $\sec\theta = -2$

reciprocal of $\cos\theta$

$$\therefore \cos\theta = -\frac{1}{2}$$

$$\theta = \frac{2\pi}{3}, \frac{4\pi}{3}$$

$\cos\theta < 0$ in
QII, III

d) $\csc\theta = 1$

reciprocal of $\sin\theta$

$$\therefore \sin\theta = 1$$

$$\theta = \frac{\pi}{2}$$