

Using the Unit Circle Reference Angles - Guided Lesson Explanation
Explanation # 1

The point $P(7\pi/6)$ lies in the third quadrant and has reference angle $\pi/6$ As shown

$$\sin\left(\frac{7\pi}{6}\right) = -\sin\frac{\pi}{6} = -\frac{\sqrt{3}}{2} \text{ and } \cos\left(\frac{7\pi}{6}\right) = -\cos\frac{\pi}{6} = -\frac{1}{2}$$

Sometimes , in order to find the trigonometric values of multiples of our basic fraction of π we must use periodicity or the even-odd function properties in addition to reference angles.

Explanation # 2

We use the identity $\cos(-x) = \cos(x)$ to write

$$\cos(-375^\circ) = \cos(375^\circ)$$

Since 375° is greater than 360° , we find a coterminal angle t , greater than zero and less than 360° , to 375° .

$$T = 375 - 360 = 15^\circ$$

Note that since 375° and angle $t = 15$ are coterminal, we can write

$$\begin{aligned} \cos(375^\circ) &= \cos(15^\circ) \\ &= \cos(15) = \pi/12 \end{aligned}$$

Explanation # 3

$\sec(2\pi/3)$ has terminal side in quadrant 2 the secant is negative. Hence

$$\sec(2\pi/3) = -\sec(\text{Tr})$$

Where Tr is the reference angle to $2\pi/3$ and is given by

$$\text{Tr} = \pi - 2\pi/3 = \pi/3$$

Hence

$$\sec(2\pi/3) = -\sec(\pi/3) = -\sqrt{3}$$

