Question

1. Just the answer please.

$$\cos \frac{3\pi}{4} = \underline{\qquad}$$

$-\dfrac{\sqrt{2}}{2}$

$\dfrac{1}{2}$

$\dfrac{\sqrt{2}}{2}$

$\dfrac{\sqrt{3}}{2}$

Solution

$$\cos\left(\frac{3\pi}{4}\right) = \cos\left(\frac{4\pi - \pi}{4}\right) = \cos\left(\pi - \frac{\pi}{4}\right) = -\cos\left(\frac{\pi}{4}\right) = -\frac{\sqrt{2}}{2}.$$

Answer: $\cos\left(\dfrac{3\pi}{4}\right) = -\dfrac{\sqrt{2}}{2}.$

2. Just the answer please

Check all that apply. $\frac{\pi}{6}$ is the reference angle for:

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

$\frac{8\pi}{6}$

$\frac{5\pi}{6}$

$\frac{13\pi}{6}$

Solution

It is necessary to subtract $360°$ (2π radians) from the angle greater than $360°$ (2π radians) until it lies between 0 and $360°$ (2π radians).

 It is necessary to add $360°$ (2π radians) to the negative angle until it lies between 0 and $360°$ (2π radians). Next step is to define which quadrant the angle is in.

Depending on the quadrant, the reference angle is given in the following table.

Quadrant	Reference angle for $\alpha°$; β radians
1	$\alpha°$; β radians
2	$180° - \alpha°$; $(\pi - \beta)$ radians
3	$\alpha° - 180°$; $(\beta - \pi)$ radians
4	$360° - \alpha°$; $(2\pi - \beta)$ radians

Angles $\frac{8\pi}{6}, \frac{5\pi}{6}$ lie in the third and second quadrants respectively. Angle $\frac{13\pi}{6}$ is greater than 2π.

$$a)\ \frac{3\pi}{6} = \frac{\pi}{2};$$

$$b)\ \frac{8\pi}{6} = \frac{4\pi}{3} = \frac{3\pi + \pi}{3} = \pi + \frac{\pi}{3};$$

$$c)\ \frac{5\pi}{6} = \frac{6\pi - \pi}{6} = \pi - \frac{\pi}{6};$$

$$d)\ \frac{13\pi}{6} = \frac{12\pi + \pi}{6} = 2\pi + \frac{\pi}{6}.$$

Accordingly, $\pi/6$ is the reference angle for $5\pi/6$ and $13\pi/6$.

Answer:

$\pi/6$ is the reference angle for $5\pi/6$ and $13\pi/6$.