Trigonometric Ratios of Associative Angles:-

1) Find the value of $\cos(31\pi/3)$

Ans:- $\cos(31\pi/3) = \cos(10\pi + \pi/3) =$

$\Rightarrow \cos\pi/3 = 1/2.$

2) $\cot x$ is not defined for ——.

Ans:- We know that $\cot x$ is not defined when $\sin x = 0$.

$\sin x = 0$, whereas x is $0, \pi, 2\pi, 3\pi, \ldots$ all integral multiples of π.

So $x = n\pi$.

3) If $\operatorname{cosec} x = -5/12$ and x lies 2nd quadrant, then find $\cos x$.

Ans:- $\operatorname{cosec} x = 5/12.$

$\sin x = \frac{1}{\operatorname{cosec} x} = \frac{12}{5}.$

We know that $\sin^2 x + \cos^2 x = 1$

$\cos^2 x = 1 - \sin^2 x = 1 - \left(\frac{12}{5}\right)^2 = 1 + \frac{144}{25} = \frac{169}{25}.$

$\cos x = \pm\frac{13}{15}.$

$\cos x$ is negative in the 2nd quadrant so $\cos x = \frac{-13}{5}.$

4) Find the value of $\sec(-45^\circ)$

Ans:- We know that $\sec(-x) = \sec x.$

$\sec(-45^\circ) = \sec 45^\circ = \frac{1}{\cos 45^\circ} = \sqrt{2}.$

5) Find the value of $\operatorname{cosec}(-30^\circ)$

Ans:- We know that $\operatorname{cosec}(-x) = -\operatorname{cosec} x$

$\therefore \operatorname{cosec}(-30^\circ) = -\operatorname{cosec} 30^\circ = -2.$

6) Find the value of $\sin\left(\frac{15\pi}{6}\right)$

Ans. $\sin(15\pi/6) = \sin\left(2\pi + \frac{3\pi}{6}\right) =$

$= \sin\left(\frac{3\pi}{6}\right) \cdot \{\sin(2n\pi + x) = \sin x\}$

$= \sin\frac{\pi}{2} = 1.$

7) Find the value of $\cos\left(\frac{17\pi}{3}\right)$

Ans:- $\cos\left(\frac{17\pi}{3}\right) = \cos(2\pi * 3 - \pi(3)$

$= [\cos(2\pi n - x) = \cos x\}$

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

$= Y_2$

8) Find the value of $\tan\frac{19\pi}{6}$.

Ans:- $\tan\frac{19\pi}{6} = \tan\left(2\pi + \frac{7\pi}{6}\right)$

$= \tan\frac{7\pi}{6}$ [$\because$ $\tan(2n\pi + x) = \tan x$]

$= \tan\left(\pi + \frac{\pi}{6}\right) = \tan\frac{\pi}{6}$

$= \frac{1}{\sqrt{3}}.$

9) Find the value of $\cos(-1500^\circ)$

Ans:- $\cos(-1500^\circ) = \cos 1500^\circ$ [$\because$ $\cos(-x) = x$,

$= \cos(4 \times 360^\circ + 60^\circ)$

$= \cos 60^\circ = Y_2.$

(10) Find the value of $\sin 1710^\circ$.

Ans:- $\sin 1710^\circ = \sin(360 \times 5 - 90^\circ)$

$= -\sin 90^\circ \quad [\because \sin(2\pi n - x) = -\sin x]$

$= -1.$

(11) Find the value of $\tan 580^\circ$.

Ans:- $\tan 580^\circ = \tan(360^\circ \times 4 + 120^\circ)$

$= \tan 120^\circ \quad [\because \tan(2n\pi + x) = \tan x]$

$= \tan(180^\circ - 60^\circ)$

$= -\tan 60^\circ \quad [\because \tan(2n\pi - x) = -\tan x]$

$= -\sqrt{3}.$

(12) Find the value of ~~$\cos 1350^\circ$~~ $\cos 1350^\circ$

Ans:- ~~$\cos 1350^\circ =$~~ $\cos 1350^\circ = \cos(360^\circ \times 4 - 90^\circ)$

$= \cos 90^\circ$

$= 0.$