Parishram 2026
Mathematics
Inverse Trigonometric Functions

DPP: 3

Q1 The value of $\cos^{-1}(\cos 240^\circ)$ is
(A) 240° (B) 120°
(C) 60° (D) 30°

Q2 The value of $\cos^{-1}(\cos(-680^\circ))$ is
(A) $\frac{2\pi}{9}$ (B) $-\frac{2\pi}{9}$
(C) $\frac{4\pi}{9}$ (D) $\frac{\pi}{9}$

Q3 The value of $\sin^{-1}(\sin\frac{5\pi}{6})$ is
(A) $\frac{\pi}{6}$ (B) $\frac{-\pi}{6}$
(C) $\frac{5\pi}{6}$ (D) $\frac{5\pi}{3}$

Q4 The value of $\cos^{-1}(\cos\frac{13\pi}{6})$ is
(A) $\frac{13\pi}{6}$ (B) $\frac{7\pi}{6}$
(C) $\frac{5\pi}{6}$ (D) $\frac{\pi}{6}$

Q5 The value of $cot^{-1}(cot\frac{5\pi}{4})$ is
(A) $\frac{\pi}{4}$ (B) $\frac{-\pi}{4}$
(C) $\frac{3\pi}{4}$ (D) None of these

Q6 The value of $\tan^{-1}(\tan\frac{7\pi}{6})$ is
(A) $\frac{7\pi}{6}$ (B) $\frac{5\pi}{6}$
(C) $\frac{\pi}{6}$ (D) None of these

Q7 The value of $sec^{-1}(\sec\frac{8\pi}{5})$ is
(A) $\frac{2\pi}{5}$ (B) $\frac{3\pi}{5}$
(C) $\frac{8\pi}{5}$ (D) None of these

Q8 The value of $\sin^{-1}(\sin\frac{2\pi}{3})$ is
(A) $\frac{2\pi}{3}$
(B) $\frac{5\pi}{3}$
(C) $\frac{\pi}{3}$
(D) None of these

Q9 The value of $\cos^{-1}(\cos(\frac{5\pi}{4}))$ is
(A) $\frac{5\pi}{4}$ (B) $\frac{3\pi}{4}$
(C) $\frac{-\pi}{4}$ (D) None of these

Q10 If $\alpha = \tan^{-1}(\tan\frac{5\pi}{4}), \beta$ then $= \tan^{-1}(-\tan\frac{2\pi}{3})$,
(A) $4\alpha = 3\beta$
(B) $3\alpha = 4\beta$
(C) $\alpha - \beta = \frac{7\pi}{12}$
(D) None of these

Answer Key

Q1	B
Q2	A
Q3	A
Q4	D
Q5	A
Q6	C
Q7	A
Q8	C
Q9	B
Q10	A

Hints & Solutions

Note: scan the QR code to watch video solution

Q1 **Text Solution:**

$\cos^{-1}(\cos 240^\circ)$

$= \cos^{-1}(\cos(180^\circ + 60^\circ))$

$\cos^{-1}(\cos 240^\circ) = \cos^{-1}(-\cos(60^\circ))$

$\cos^{-1}(\cos 240^\circ) = \pi - \cos^{-1}(\cos(60^\circ))$

$\cos^{-1}(\cos 240^\circ) = 180^\circ - 60^\circ$

$\cos^{-1}(\cos 240^\circ) = 120^\circ$

Video Solution:

Q2 **Text Solution:**

$\cos^{-1}((\cos(-680^\circ))$

$= \cos^{-1}(\cos 680^\circ)$

We know $\cos^{-1}(\cos\theta) = \theta$ if $\theta \in [0, \pi]$

$\therefore \cos^{-1}(\cos 680^\circ)$

$= \cos^{-1}((\cos(720^\circ - 40^\circ))$

$= \cos^{-1}(\cos 40^\circ)$

= 40°

$= \frac{2\pi}{9}$

Video Solution:

Q3 **Text Solution:**

$\sin^{-1}(\sin \frac{5\pi}{6})$

We know $\sin^{-1}(\sin\theta) = \theta$ if $\theta \in [-\frac{\pi}{2}, \frac{\pi}{2}]$

$\therefore \sin^{-1}(\sin \frac{5\pi}{6})$

$= \sin^{-1}(\sin(\pi - \frac{\pi}{6}))$

$= \sin^{-1}(\sin \frac{\pi}{6})$

$= \frac{\pi}{6}$

Video Solution:

Q4 **Text Solution:**

$\cos^{-1}(\cos \frac{13\pi}{6})$

We know $\cos^{-1}(\cos\theta) = \theta$ if $\theta \in [0, \pi]$

$\therefore \cos^{-1}(\cos \frac{13\pi}{6})$

$= \cos^{-1}(\cos(2\pi + \frac{\pi}{6}))$

$= \cos^{-1}(\cos \frac{\pi}{6})$

$= \frac{\pi}{6}$

Video Solution:

Q5 **Text Solution:**

$cot^{-1}(cot \frac{5\pi}{4})$

We know $cot^{-1}(cot\theta) = \theta$ if $\theta \in (0, \pi)$

$\therefore cot^{-1}(cot \frac{5\pi}{4})$

$= cot^{-1}(cot(\pi + \frac{\pi}{4}))$

$= cot^{-1}(cot \frac{\pi}{4})$

$= \frac{\pi}{4}$

Video Solution:

Q6 **Text Solution:**

$\tan^{-1}\left(\tan\frac{7\pi}{6}\right)$

We know $\tan^{-1}\left(\tan\theta\right)=\theta$ if $\theta\in\left(-\frac{\pi}{2},\frac{\pi}{2}\right)$

$\therefore \tan^{-1}\left(\tan\frac{7\pi}{6}\right)$

$=\tan^{-1}\left(\tan\left(\pi+\frac{\pi}{6}\right)\right)$

$=\tan^{-1}\left(\tan\frac{\pi}{6}\right)$

$=\frac{\pi}{6}$

Video Solution:

Q7 **Text Solution:**

$\sec^{-1}\left(\sec\frac{8\pi}{5}\right)$

We know

$\sec^{-1}\left(\sec\theta\right)=\theta$ if $\theta\in\left[0,\pi\right]\sim\left\{\frac{\pi}{2}\right\}$

$\therefore \sec^{-1}\left(\sec\frac{8\pi}{5}\right)$

$=\sec^{-1}\left(\sec\left(2\pi-\frac{2\pi}{5}\right)\right)$

$=\sec^{-1}\left(\sec\frac{2\pi}{5}\right)$

$=\frac{2\pi}{5}$

Video Solution:

Q8 **Text Solution:**

$\sin^{-1}\left(\sin\frac{2\pi}{3}\right)$

We know $\sin^{-1}\left(\sin\ \theta\right)=\theta$ if $\theta\in\left[-\frac{\pi}{2},\frac{\pi}{2}\right]$

But $\frac{2\pi}{3}\notin\left[-\frac{\pi}{2},\frac{\pi}{2}\right]$

$\therefore \sin^{-1}\left(\sin\frac{2\pi}{3}\right)$

$=\sin^{-1}\left(\sin\left(\pi-\frac{\pi}{3}\right)\right)$

$=\sin^{-1}\left(\sin\frac{\pi}{3}\right)$

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

Video Solution:

Q9 **Text Solution:**

$\cos^{-1}\left(\cos\left(\frac{5\pi}{4}\right)\right)$

We know $\cos^{-1}\left(\cos\theta\right)=\theta$ if $\theta\in\left[0,\ \pi\right]$

$\therefore \cos^{-1}\left(\cos\left(\frac{5\pi}{4}\right)\right)$

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

$=\cos^{-1}\left(\cos\frac{3\pi}{4}\right)$

$=\frac{3\pi}{4}$

Video Solution:

Q10 **Text Solution:**

Consider $\alpha=\tan^{-1}\left(\tan\frac{5\pi}{4}\right)$

$\Rightarrow \alpha=\tan^{-1}\left(\tan\left(\pi+\frac{\pi}{4}\right)\right)$

$\Rightarrow \alpha=\tan^{-1}\left(\tan\frac{\pi}{4}\right)$

Consider $\beta=\tan^{-1}\left(-\tan\frac{2\pi}{3}\right)$

$\Rightarrow \beta=\tan^{-1}\left(-\tan\left(\pi-\frac{\pi}{3}\right)\right)$

$\Rightarrow \beta=\tan^{-1}\left(\tan\frac{\pi}{3}\right)$

$\Rightarrow \beta=\frac{\pi}{3}$

$\therefore 4\alpha=3\beta$

Video Solution: