PARISHRAM 2026

Mathematics

DPP: 4

Inverse Trigonometric Functions

Q1 $\tan^{-1}\frac{2}{11}+\tan^{-1}\frac{7}{24}=$

(A) $\frac{\pi}{4}$ (B) $\frac{\pi}{2}$

(C) $\tan^{-1}(2)$ (D) $\tan^{-1}\left(\frac{1}{2}\right)$

Q2 $\tan^{-1}\frac{3}{4}+\tan^{-1}\frac{3}{5}-\tan^{-1}\frac{8}{19}=$

(A) $\frac{\pi}{3}$ (B) $\frac{\pi}{4}$

(C) $\frac{\pi}{6}$ (D) None of these

Q3 $\cot^{-1}7+\cot^{-1}8+\cot^{-1}18=$

(A) $\cot^{-1}\frac{1}{3}$ (B) $\tan^{-1}3$

(C) $\cot^{-1}3$ (D) None of these

Q4 $\tan^{-1}1+\tan^{-1}2+\tan^{-1}3=$

(A) π (B) $\frac{\pi}{2}$

(C) $-\frac{\pi}{2}$ (D) $-\pi$

Q5 $\cos^{-1}\frac{12}{13}+\sin^{-1}\frac{3}{5}=$

(A) $\tan^{-1}\frac{65}{56}$

(B) $\sin^{-1}\frac{56}{65}$

(C) $\cos^{-1}\frac{56}{65}$

(D) None of these

Q6 $\sin^{-1}\frac{3}{5}+\sin^{-1}\frac{8}{17}=$

(A) $\cos^{-1}\frac{77}{85}$

(B) $\tan^{-1}\frac{85}{77}$

(C) $\sin^{-1}\frac{77}{85}$

(D) None of these

Q7 $\cos^{-1}\frac{4}{5}+\cos^{-1}\frac{12}{13}=$

(A) $\cos^{-1}\frac{33}{65}$

(B) $\sin^{-1}\frac{33}{65}$

(C) $\tan^{-1}\frac{33}{65}$

(D) None of these

Q8 $\cos^{-1}\frac{4}{5}-\cos^{-1}\frac{15}{17}=$

(A) $\cot^{-1}\frac{84}{85}$

(B) $\tan^{-1}\frac{84}{85}$

(C) $\sin^{-1}\frac{84}{85}$

(D) $\cos^{-1}\frac{84}{85}$

Q9 If $\tan^{-1}\frac{x-1}{x-2}+\tan^{-1}\frac{x+1}{x+2}=\frac{\pi}{4}$ then $x=$

(A) $\frac{1}{\sqrt{2}}$ (B) $\pm\frac{1}{\sqrt{2}}$

(C) $-\frac{1}{\sqrt{2}}$ (D) None of these

Q10 If $\tan^{-1}2x+\tan^{-1}3x=\frac{\pi}{4}$ then $x=$

(A) 1 (B) $-1,\frac{1}{6}$

(C) $\frac{1}{6}$ (D) None of these

Answer Key

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

Hints & Solutions

Note: scan the QR code to watch video solution

Q1 **Text Solution:**

We have,

$$\tan^{-1}\frac{2}{11}+\tan^{-1}\frac{7}{24}$$

$$=\tan^{-1}\left\{\frac{\frac{2}{11}+\frac{7}{24}}{1-\frac{2}{11}\times\frac{7}{24}}\right\}$$

$$\left[\because \tan^{-1}x+\tan^{-1}y=\tan^{-1}\left(\frac{x+y}{1-xy}\right),\right.$$

$$\left.\text{if } xy<1\right]$$

$$=\tan^{-1}\left\{\frac{48+77}{264-14}\right\}=\tan^{-1}\left(\frac{125}{250}\right)$$

$$=\tan^{-1}\left(\frac{1}{2}\right)$$

Video Solution:

Q2 **Text Solution:**

$$\text{LHS}=\tan^{-1}\frac{3}{4}+\tan^{-1}\frac{3}{5}-\tan^{-1}\frac{8}{19}$$

$$\Rightarrow \text{LHS}=\left\{\tan^{-1}\frac{3}{4}+\tan^{-1}\frac{3}{5}\right\}$$

$$-\tan^{-1}\frac{8}{19}$$

$$\Rightarrow \text{LHS}=\tan^{-1}\left\{\frac{\frac{3}{4}+\frac{3}{5}}{1-\frac{3}{4}\times\frac{3}{5}}\right\}-\tan^{-1}\frac{8}{19}$$

$$\Rightarrow \text{LHS}=\tan^{-1}\frac{27}{11}-\tan^{-1}\frac{8}{19}$$

$$\Rightarrow \text{LHS}=\tan^{-1}\left\{\frac{\frac{27}{11}-\frac{8}{19}}{1+\frac{27}{11}\times\frac{8}{19}}\right\}=\tan^{-1}\frac{425}{425}$$

$$=\tan^{-1}1=\frac{\pi}{4}=\text{R.H.S.}$$

Video Solution:

Q3 **Text Solution:**

$$\text{LHS}=\cot^{-1}7+\cot^{-1}8+\cot^{-1}18$$

$$=\tan^{-1}\frac{1}{7}+\tan^{-1}\frac{1}{8}+\tan^{-1}\frac{1}{18}$$

$$\left[\because \cot^{-1}(x)=\tan^{-1}\frac{1}{x},\ \text{if } x>0\right]$$

$$=\left\{\tan^{-1}\frac{1}{7}+\tan^{-1}\frac{1}{8}\right\}+\tan^{-1}\frac{1}{18}$$

$$=\tan^{-1}\left\{\frac{\frac{1}{7}+\frac{1}{8}}{1-\frac{1}{7}\times\frac{1}{8}}\right\}+\tan^{-1}\frac{1}{18}$$

$$\left[\because xy=\frac{1}{7}\times\frac{1}{8}<1\right]$$

$$=\tan^{-1}\frac{3}{11}+\tan^{-1}\frac{1}{18}$$

$$=\tan^{-1}\left\{\frac{\frac{3}{11}+\frac{1}{18}}{1-\frac{3}{11}\times\frac{1}{18}}\right\}$$

$$\left[\because xy=\frac{3}{11}\times\frac{1}{18}<1\right]$$

$$=\tan^{-1}\frac{65}{195}=\tan^{-1}\frac{1}{3}=\cot^{-1}3.$$

Video Solution:

Q4 **Text Solution:**

$$\tan^{-1}1+\tan^{-1}2+\tan^{-1}3=\tan^{-1}1$$

$$+\left(\tan^{-1}2+\tan^{-1}3\right)$$

We have,

$$\tan^{-1}2+\tan^{-1}3$$

$$=\pi$$

$$+\tan^{-1}\left\{\frac{2+3}{1-2\times3}\right\}$$

$$\left[\because \tan^{-1}x+\tan^{-1}y=\pi\right.$$

$$\left.+\tan^{-1}\left(\frac{x+y}{1-xy}\right),\ \text{if } xy>1\right]$$

$$=\pi+\tan^{-1}(-1)=\pi-\frac{\pi}{4}=\frac{3\pi}{4}$$

$$\tan^{-1}1+\tan^{-1}2+\tan^{-1}3=\tan^{-1}1$$

$$+\left(\tan^{-1}2+\tan^{-1}3\right)$$

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

Video Solution:

Q5 **Text Solution:**

$\cos^{-1}\frac{12}{13}+\sin^{-1}\frac{3}{5}$

$=\sin^{-1}\frac{5}{13}+\sin^{-1}\frac{3}{5}$

$\left[\because \cos^{-1}\frac{12}{13}=\sin^{-1}\frac{5}{13}\right]$

$=\sin^{-1}\left\{\frac{5}{13}\times\sqrt{1-\left(\frac{3}{5}\right)^2}+\frac{3}{5}\times\sqrt{1-\left(\frac{5}{13}\right)^2}\right\}$

$=\sin^{-1}\left\{\frac{5}{13}\times\frac{4}{5}+\frac{3}{5}\times\frac{12}{13}\right\}=\sin^{-1}\frac{56}{65}$

Video Solution:

Q6 **Text Solution:**

Using $\sin^{-1}x+\sin^{-1}y$

$=\sin^{-1}\left\{x\sqrt{1-y^2}+y\sqrt{1-x^2}\right\}$

we obtain

$\sin^{-1}\frac{3}{5}+\sin^{-1}\frac{8}{17}$

$=\sin^{-1}\left\{\frac{3}{5}\sqrt{1-\left(\frac{8}{17}\right)^2}+\frac{8}{17}\sqrt{1-\left(\frac{3}{5}\right)^2}\right\}$

$=\sin^{-1}\left\{\frac{3}{5}\times\frac{15}{17}+\frac{8}{17}\times\frac{4}{5}\right\}=\sin^{-1}\frac{77}{85}$

Video Solution:

Q7 **Text Solution:**

We have,

$\cos^{-1}\frac{4}{5}+\cos^{-1}\frac{12}{13}$

$=\cos^{-1}\left\{\frac{4}{5}\times\frac{12}{13}-\sqrt{1-\left(\frac{4}{5}\right)^2}\sqrt{1-\left(\frac{12}{13}\right)^2}\right\}$

$=\cos^{-1}\left\{\frac{4}{5}\times\frac{12}{13}-\frac{3}{5}\times\frac{5}{13}\right\}$

$=\cos^{-1}\left\{\frac{48}{65}-\frac{15}{65}\right\}=\cos^{-1}\frac{33}{65}$

Video Solution:

Q8 **Text Solution:**

$\cos^{-1}\frac{4}{5}-\cos^{-1}\frac{15}{17}$

$=\cos^{-1}\left\{\frac{4}{5}\times\frac{15}{17}+\sqrt{1-\left(\frac{4}{5}\right)^2}\times\sqrt{1-\left(\frac{15}{17}\right)^2}\right\}$

$=\cos^{-1}\left\{\frac{4}{5}\times\frac{15}{17}+\frac{3}{5}\times\frac{8}{17}\right\}$

$=\cos^{-1}\left\{\frac{60}{85}+\frac{24}{85}\right\}=\cos^{-1}\frac{84}{85}$

Video Solution:

Q9 **Text Solution:**

We have,

$\tan^{-1}\frac{x-1}{x-2}+\tan^{-1}\frac{x+1}{x+2}=\frac{\pi}{4}$

$\Rightarrow \tan^{-1}\frac{x-1}{x-2}+\tan^{-1}\frac{x+1}{x+2}=\tan^{-1}1$

$\Rightarrow \tan^{-1}\frac{x-1}{x-2}=\tan^{-1}1-\tan^{-1}\frac{x+1}{x+2}$

$\Rightarrow \tan^{-1}\frac{x-1}{x-2}=\tan^{-1}\left(\frac{1-\frac{x+1}{x+2}}{1+\frac{x+1}{x+2}}\right)$

$\tan^{-1}\frac{x-1}{x-2}=\tan^{-1}\frac{x+2-x-1}{x+2+x+1}$

$\Rightarrow \tan^{-1}\frac{x-1}{x-2}=\tan^{-1}\frac{1}{2x+3}$

$\Rightarrow \frac{x-1}{x-2}=\frac{1}{2x+3}$

$\Rightarrow \quad (2x+3)(x-1) = x-2 \Rightarrow 2x^2 + x - 3 = x - 2 \Rightarrow 2x^2 - 1 = 0 \Rightarrow x = \pm\frac{1}{\sqrt{2}}$

Video Solution:

Q10 **Text Solution:**

We have

$\tan^{-1} 2x + \tan^{-1} 3x = \frac{\pi}{4}$

$\Rightarrow \tan^{-1}\left\{\frac{2x+3x}{1-2x\times 3x}\right\} = \tan^{-1} 1, \text{ if } 6x^2 < 1$

$\Rightarrow \frac{5x}{1-6x^2} = 1, \text{ if } 6x^2 < 1$

$\Rightarrow 6x^2 + 5x - 1 = 0 \text{ and } x^2 < \frac{1}{6}$

$\Rightarrow (6x-1)(x+1) = 0 \text{ and } x^2 < \frac{1}{6}$

$\Rightarrow x = -1, \frac{1}{6} \text{ and } x^2 < \frac{1}{6}$

$\Rightarrow x = \frac{1}{6}$

Video Solution: