(15) $\tan^{-1}\left(\frac{x-1}{x-2}\right) + \tan^{-1}\left(\frac{x+1}{x+2}\right) = \frac{\pi}{4}$

$\Rightarrow \tan^{-1}\left(\frac{\frac{x-1}{x-2} + \frac{x+1}{x+2}}{1 - \left(\frac{x-1}{x-2}\right)\left(\frac{x+1}{x+2}\right)}\right) = \frac{\pi}{4}$

$\Rightarrow \tan^{-1}\dfrac{\dfrac{(x-1)(x+2)+(x+1)(x-2)}{(x-2)(x+2)}}{\dfrac{(x-2)(x+2)-(x-1)(x+1)}{(x-2)(x+2)}} = \frac{\pi}{4}$

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

$\Rightarrow \tan^{-1}\dfrac{2x^2-4}{-3} = 1$

$\Rightarrow 2x^2 - 4 = -3$

$2x^2 = -3+4$

$2x^2 = 1$

$x^2 = \frac{1}{2}$

$x = \pm\frac{1}{\sqrt{2}}$ Ans

$\frac{45 \times \pi}{180}$ $\quad 90 \times 2 - 45$ $\quad \frac{3\pi}{4} \times \frac{180}{\pi}$ $\quad 45$

$90 \times 1 + 45$ $\quad 135^\circ$

$\frac{180}{135}$ $\quad \frac{90}{45}$

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

$\Rightarrow \sin^{-1}\left(\frac{\sqrt{3}}{2}\right) = y$

$\sin y = \frac{\sqrt{3}}{2}$

$\sin y \Rightarrow \frac{\pi}{3}$ Ans

Sin	All
C	T

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

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

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

$\tan y = -\frac{\pi}{4}$

(18) $\tan\left(\sin^{-1}\frac{3}{5} + \cot^{-1}\frac{3}{2}\right)$

$\Rightarrow \sin^{-1}\frac{3}{5} = y$

$\frac{3}{5} = \sin y$

$\tan^{-1} = \frac{3}{4}$

$h^2 = p^2 + b^2$

$(5)^2 = (3)^2 + b^2$

$b^2 = (5)^2 - (3)^2$

$= \sqrt{25 - 9}$

$= \sqrt{16} \Rightarrow \frac{4}{2}$

$90x$

$\frac{7\pi}{6} \times \frac{180}{\pi}$

210

$30 \times \frac{11}{180}$

$180 \overline{)330}$

210

$$\tan\left(\tan^{-1}\frac{3}{4} + \tan^{-1}\frac{2}{3}\right)$$

$$\Rightarrow \tan\left(\frac{\frac{3}{4}+\frac{2}{3}}{1-\frac{3}{4}\times\frac{2}{3}}\right)$$

$$\Rightarrow \tan\left(\frac{\frac{3\times3+2\times4}{(4\times3)}}{\frac{(4\times3)-(3\times2)}{(4\times3)}}\right)$$

$$\Rightarrow \tan\left(\frac{9+8}{\frac{4\times3}{12-6}}\right)$$

$$\Rightarrow \tan\Rightarrow\frac{17}{6} \quad \text{AII}_2$$

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

$$\Rightarrow \cos^{-1}\left(\frac{\sqrt{3}}{2}\right) = y$$

$$\cos - \frac{\sqrt{3}}{2} = \cos y$$

sin	All
tan	cos

$90 \times 2 = 30$

$$\cos\left(\pi - \frac{\pi}{6}\right) = \cos y$$

$$\cos\left(\frac{5\pi}{6}\right) = \cos y$$

$$\boxed{y = \frac{5\pi}{6}}$$

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

$\Rightarrow \sin^{-1}\left(-\frac{1}{2}\right) = y$

$\Rightarrow \left(-\frac{1}{2}\right) = \sin y$

$\Rightarrow -\sin\frac{\pi}{6} = \sin y$

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