Problem 4:

Domain of $f(x) = \sin^{-1}x + \operatorname{cosec}^{-1}x$ is :

(a) $[-1, 1]$ (b) $[1, \infty)$ (c) $\{-1, 1\}$ (d) $\mathbb{R}$

Solution: for $\sin^{-1}x$ domain is $[-1, 1]$.

for $\operatorname{cosec}^{-1}x$, domain is $(-\infty, -1] \cup [1, \infty)$.

for $f(x)$ to be defined, both $\sin^{-1}x$ & $\operatorname{cosec}^{-1}x$ should be defined.

So, we need to take the intersection of the domains of $\sin^{-1}x$ and $\cos^{-1}x$.

Required domain $= [-1, 1] \cap ((-\infty, -1] \cup [1, \infty))$

$= \{-1, 1\}$.