2. The domain of the function $f(x)=\sin^{-1}\left(\frac{|x|+5}{x^2+1}\right)$ is $(-\infty,-a]\cup[a,\infty]$. Then a is equal to :

[Sep. 02, 2020 (I)]

(a) $\frac{\sqrt{17}}{2}$ (b) $\frac{\sqrt{17}-1}{2}$ (c) $\frac{1+\sqrt{17}}{2}$ (d) $\frac{\sqrt{17}}{2}+1$

2. **(c)** $\because f(x)=\sin^{-1}\left(\frac{|x|+5}{x^2+1}\right)$

$\therefore -1\le\frac{|x|+5}{x^2+1}\le 1$

$\Rightarrow |x|+5\le x^2+1$ $\quad[\because x^2+1\ne 0]$

$\Rightarrow x^2-|x|-4\ge 0$

$\Rightarrow\left(|x|-\frac{1-\sqrt{17}}{2}\right)\left(|x|-\frac{1+\sqrt{17}}{2}\right)\ge 0$

$\Rightarrow x\in\left(-\infty,-\frac{1+\sqrt{17}}{2}\right)\cup\left[\frac{1+\sqrt{17}}{2},\infty\right)$

$\therefore a=\frac{1+\sqrt{17}}{2}$