The number of solutions of the equation

$$\sin^{-1}\left[x^2 + \tfrac{1}{3}\right] + \cos^{-1}\left[x^2 - \tfrac{2}{3}\right] = x^2,$$

for x ∈ [-1, 1], and [x] denotes the greatest integer less than or equal to x, is :

(1) 2

(2) 0

(3) 4

(4) Infinite

Given equation

$$\sin^{-1}\left[x^2 + \frac{1}{3}\right] + \cos^{-1}\left[x^2 - \frac{2}{3}\right] = x^2$$

Now, $\sin^{-1}\left[x^2 + \frac{1}{3}\right]$ is defined if

$$-1 \le x^2 + \frac{1}{3} < 2 \implies \frac{-4}{3} \le x^2 < \frac{5}{3}$$

$$\implies \boxed{0 \le x^2 < \frac{5}{3}} \qquad \text{....(1)}$$

and $\cos^{-1}\left[x^2 - \frac{2}{3}\right]$ is defined if

$$-1 \le x^2 - \frac{2}{3} < 2 \implies \frac{-1}{3} \le x^2 < \frac{8}{3}$$

$$\implies \boxed{0 \le x^2 < \frac{8}{3}} \qquad \text{....(2)}$$

So, form (1) and (2) we can conclude

$$0 \le x^2 < \frac{5}{3}$$

Case - I if $0 \le x^2 < \frac{2}{3}$

$\sin^{-1}(0) + \cos^{-1}(-1) = x^2$

$\Rightarrow x + \pi = x^2$

$\Rightarrow x^2 = \pi$

but $\pi \notin \left[0, \frac{2}{3}\right)$

$\Rightarrow$ No value of 'x'

Case - II if $\frac{2}{3} \le x^2 < \frac{5}{3}$

$\sin^{-1}(1) + \cos^{-1}(0) = x^2$

$\Rightarrow \frac{\pi}{2} + \frac{\pi}{2} = x^2$

$\Rightarrow x^2 = \pi$

but $\pi \notin \left[\frac{2}{3}, \frac{5}{3}\right)$

$\Rightarrow$ No value of 'x'

So, number of solutions of the equation is zero.