MATRIX MATCH TYPE

List I	List II
a. If $(\sin^{-1}x)^2+(\sin^{-1}y)^2=\frac{\pi^2}{2}$, then x^3+y^3 can be	p. 0
b. $(\cos^{-1}x)^2+(\cos^{-1}y)^2=2\pi^2$, then x^5+y^5 can be	q. –2
c $(\sin^{-1}x)^2(\cos^{-1}y)^2=\frac{\pi^4}{4}$, then $x-y$ can be	r. 2
d. $\lvert\sin^{-1}x-\sin^{-1}y\rvert=\pi$, then $x-y$ can be	s. –1

Codes

	a	b	c	d
(1)	r	q	p	s
(2)	s	r	q	p
(3)	q	s	p	r
(4)	s	r	q	p

SOLUTION

(3) a. $(\sin^{-1} x)^2 + (\sin^{-1} y)^2 = \dfrac{\pi^2}{2}$

$\Rightarrow \quad (\sin^{-1} x)^2 = (\sin^{-1} y)^2 = \dfrac{\pi^2}{4}$

$\Rightarrow \quad \sin^{-1} x = \pm \dfrac{\pi}{2}, \sin^{-1} y = \pm \dfrac{\pi}{2}$

$\Rightarrow \quad x = \pm 1$ and $y = \pm 1$

$\Rightarrow \quad x^3 + y^3 = -2, 0, 2$

b. $(\cos^{-1} x)^2 + (\cos^{-1} y)^2 = 2\pi^2$

$\Rightarrow \quad (\cos^{-1} x)^2 = (\cos^{-1} y)^2 = \pi^2$

$\Rightarrow \quad x = y = -1$

$\Rightarrow \quad x^5 + y^5 = -1$

c. $(\sin^{-1} x)^2 (\cos^{-1} y)^2 = \dfrac{\pi^4}{4}$

$\Rightarrow \quad (\sin^{-1} x)^2 = \dfrac{\pi^2}{4}$ and $(\cos^{-1} y)^2 = \pi^2$

$\Rightarrow \quad (\sin^{-1} x) = \pm \dfrac{\pi}{2}$ and $(\cos^{-1} y) = \pi$

$\Rightarrow \quad x = \pm 1$ and $y = -1$

$x - y = 0, 2$

d. $|\sin^{-1} x - \sin^{-1} y| = \pi$

$\Rightarrow \quad \sin^{-1} x = -\dfrac{\pi}{2}$ and $\sin^{-1} y = \dfrac{\pi}{2}$

$\Rightarrow \quad x = -1$ and $y = 1$

or $\quad \sin^{-1} x = \dfrac{\pi}{2}$ and $\sin^{-1} y = -\dfrac{\pi}{2}$

$\Rightarrow \quad x = 1$ and $y = -1$

$\Rightarrow \quad x - y = -2, 2$