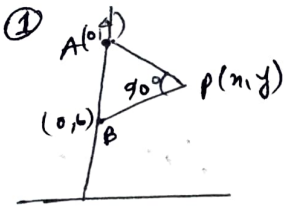
সঞ্চারপথ

① 

এখানে,

$AB^2 = AP^2 + PB^2$

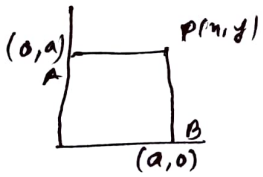
$(6-4)^2 = (x-0)^2 + (y-4)^2 + (x-0)^2 + (y-6)^2$

$\Rightarrow 4 = x^2+y^2-8y+16+x^2+y^2-12y+36$

$\Rightarrow 2x^2+2y^2-20y+48 = 0$

$\Rightarrow x^2+y^2-10y+24 = 0$

∴ নির্ণেয় সঞ্চার পথের সমীকরণ $x^2+y^2-10y+24=0$

② 

ধরি $P(x,y)$

শর্তমতে,

$PA^2 - PB^2 = \pm 2a$

$\Rightarrow (x-a)^2+(y-0)^2-\{(x-0)^2+(y-a)^2\} = \pm 2a$

$\Rightarrow x^2-2ax+a^2+y^2-x^2-y^2+2ay-a^2 = \pm 2a$

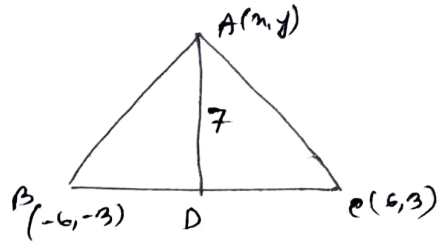
$\Rightarrow 2a(y-x) = \pm 2a$

$\Rightarrow x-y \pm 1 = 0$

∴ নির্ণেয় সঞ্চারপথ, $x-y+1=0$ এবং

$x-y-1=0$

Ans

③ 

D এর স্থানাঙ্ক $= \frac{6-6}{2} = 0$

$= \frac{3-3}{2} = 0$

শর্তমতে, $\sqrt{(x-0)^2+(y-0)^2} = 7$

$(x-0)^2+(y-0)^2 = 49$

$x^2+y^2 = 49$

④

$A(2,3)$

$B(-1,4)$

$P(x,y)$

শর্তমতে, $PA : PB = 2:3$

$\frac{\sqrt{(x-2)^2+(y-3)^2}}{\sqrt{(x+1)^2+(y-4)^2}} = \frac{2}{3}$

$\frac{(x-2)^2+(y-3)^2}{(x+1)^2+(y-4)^2} = \frac{4}{9}$

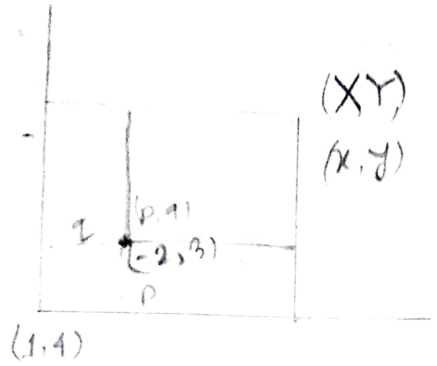
$\frac{x^2-4x+4+y^2-6y+9}{x^2+2x+1+y^2-8y+16} = \frac{4}{9}$

$\Rightarrow 9x^2-36x+36+9y^2-54y+81 = 4x^2+4y^2+8x+4+16y^2-32y+64$

$\Rightarrow 5x^2+5y^2-44x-22y+49 = 0$

Ans

(5)



$P \cdot X = P + x$

$1 = P - 2 + x$

$x = 3$

~~$Y = q + y$~~

$Y = q + y$

$4 = 3 + y$

$y = 1$

∴ নতুন স্থানাঙ্ক $(3, 1)$

Again,

$$x^2 + y^2 + 4x - 6y = 0$$

$(x-2)^2 + (y+3)^2 + 4(x-2) - 6(y+3) = 0$

এখানে চিহ্ন দিতে ভুলো না।

$\Rightarrow x^2 - 4x + 4 + y^2 + 6y + 9 + 4x + 8 - 6y - 18 = 0$

$\Rightarrow x^2 + y^2 = 13$ (Ans)