Nishant Jindal

LOCUS

A) Set of Pt. Which follow Qs's Cnd^n

B) Steps.

A) first assumeht Whose locus is to be known.
let (h, K)

(B) Now follow Qs's Cnd^n

(C) after Solving ($h \to x$, $k \to y$)

|tik
61→66.
67-69 } done

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26) $\frac{1}{2}\begin{vmatrix} 1 & 1 \\ 0 & \sec\theta \\ \csc\theta & 0 \\ 1 & 1 \end{vmatrix} = 0$

27) $\Delta = \frac{1}{2}\begin{vmatrix} 1 & 2 \\ -2 & 3 \\ -3 & -4 \\ 1 & 2 \end{vmatrix}$

28) $\Delta = \frac{1}{2}\begin{vmatrix} 2 & -1 \\ 4 & 3 \\ -1 & 2 \\ -3 & -2 \\ 2 & -1 \end{vmatrix}$

31) $\begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}^2 = \begin{vmatrix} x_1 & y_1 \\ x_2 & y_2 \\ x_3 & y_3 \end{vmatrix}$

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31) $\begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}^2 = \begin{vmatrix} x_1 & y_1 \\ x_2 & y_2 \\ x_3 & y_3 \\ x_1 & y_1 \end{vmatrix}^2 = 4\Delta^2$

$= 4 \times \frac{3}{4}(a^2)^2$

$= \frac{3}{4} a^4$

$2\Delta = \begin{vmatrix} x_1 & y_1 \\ x_2 & k \\ x_3 & y_3 \\ x_1 & y_1 \end{vmatrix}$

Eq^n $\Delta = \frac{\sqrt{3}}{4} a^2$

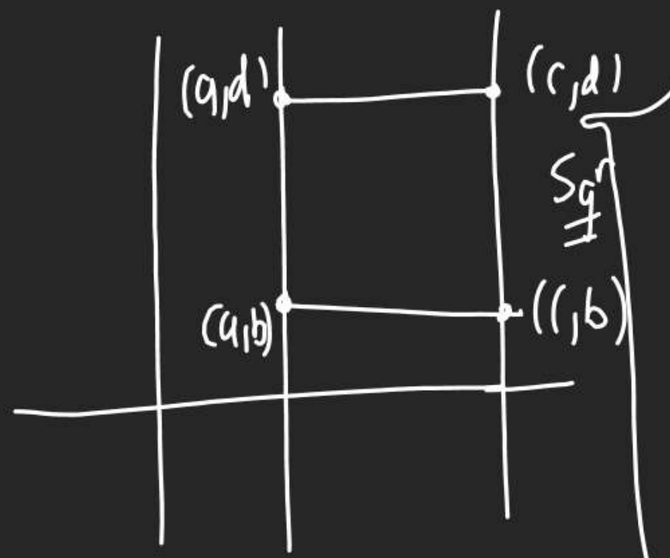
$4\Delta = \sqrt{3} a^2$

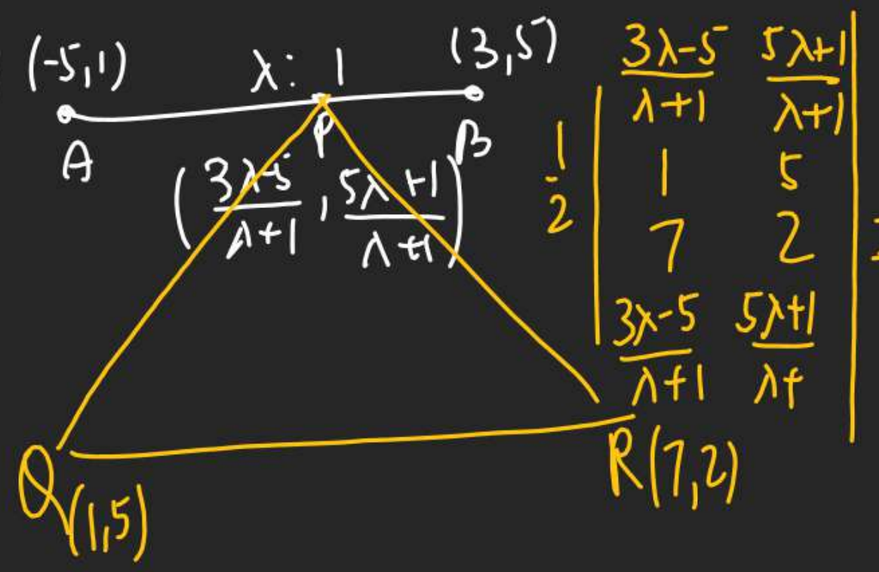
35) $\begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix} = \begin{vmatrix} a_1 & b_1 & 1 \\ a_2 & b_2 & 1 \\ a_3 & b_3 & 1 \end{vmatrix}$

$\frac{1}{2} \begin{vmatrix} x_1 & y_1 \\ x_2 & y_2 \\ x_3 & y_3 \\ x_1 & y_1 \end{vmatrix} = \frac{1}{2} \begin{vmatrix} a_1 & b_1 \\ a_2 & b_2 \\ a_3 & b_3 \\ a_1 & b_1 \end{vmatrix}$

$\Delta_1 = \Delta_2$

33) $(a,b), (a,d), (c,d), (c,b)$



36) 

$\frac{1}{2} \begin{vmatrix} \frac{3\lambda-5}{\lambda+1} & \frac{5\lambda+1}{\lambda+1} \\ 1 & 5 \\ 7 & 2 \\ \frac{3\lambda-5}{\lambda+1} & \frac{5\lambda+1}{\lambda+1} \end{vmatrix} = \pm 9$

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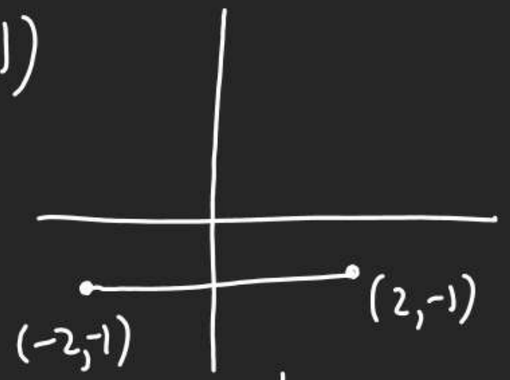
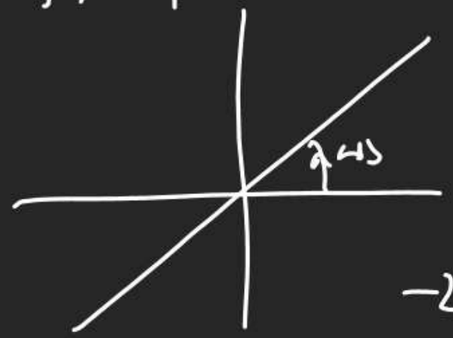
61)





	-2	-1
X	$\cos 45^\circ$	$\sin 45^\circ$
Y	$-\sin 45^\circ$	$\cos 45^\circ$

$X = -2\cos 45^\circ - 1\sin 45^\circ$

$Y = -2\sin 45^\circ - 1\cos 45^\circ$

62) $(h,k) \equiv (2,-1)$

$X = x-2, \quad Y = y+1$

$x = X+2, \quad y = Y-1$

$x_{old} = X+2, \quad y_{old} = Y-1$

$(X+2)^2 + (Y-1)^2 - 4(X+2) + 2(Y-1) + 1 = 0.$

63) $\lambda = 4-1, \quad Y = 5-(-2)$

$(3,7)$

64)

	x	y
4	$\cos 135^\circ$	$\sin 135^\circ$
-3	$-\sin 135^\circ$	$\cos 135^\circ$

$x = 4\cos 135^\circ + (-3)(-\sin 135^\circ)$

$y = 4\sin 135^\circ + (-3)\cos 135^\circ$

LOCUS.

① find Locus of a Pt. whose abscissa & Ordinate are equal.

A) Let Pt. (h, K)

B) $\left.\begin{matrix} abs = h \\ ord. = K \end{matrix}\right\}$

C) Acc. to Q's $\rightarrow h = k$.

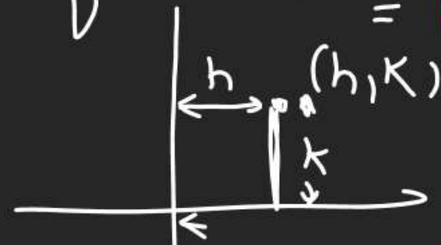
$x = y$

$\Rightarrow y - x = 0$ is locus.

Q2 find Locus of a Pt. In whose dist. from X Axis is equal to dist. from Y Axis?

① let Pt. (h, K)

② dist. of (h, K) from X Axis $= |K|$



dist of (h, K) from y Axis $= |h|$

③ A/Q's $|h| = |K|$

$\Rightarrow h^2 = K^2 \Rightarrow x^2 - y^2 = 0$ Ans

Q3. find LOCUS of Pt. whose dist. from origin is thrice of its dist. from X Axis

① let Pt (h, K)

② (h, K)'s $(0,0)$ distance $= \sqrt{(h-0)^2 + (K-0)^2}$

$= \sqrt{h^2 + K^2}$

③ dist from origin $= 3$ (dist. from X Axis)

$\sqrt{h^2 + K^2} = 3|K|$

$h^2 + K^2 = 9K^2$

$h^2 - 8K^2 = 0$

$x^2 - 8y^2 = 0$ Ans

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Q4 Find Locus of a Pt. Whose distance from P(2,3) remains 5 units always.

① Let Pt = (h, K)

② dist. of (h, K) from (2,3) = 5

$\Rightarrow \sqrt{(h-2)^2+(K-3)^2} = 5$

$(h-2)^2+(K-3)^2 = 25$

$(x-2)^2+(y-3)^2 = 25$

Q5 Find Locus of a Pt. Whose distance from A(2,3) & B(5,7) Remains Same/Equal.

① Let Pt. is (h, K)

② dist. of (h, K) from (2,3) = dist of (h, K) from (5,7)

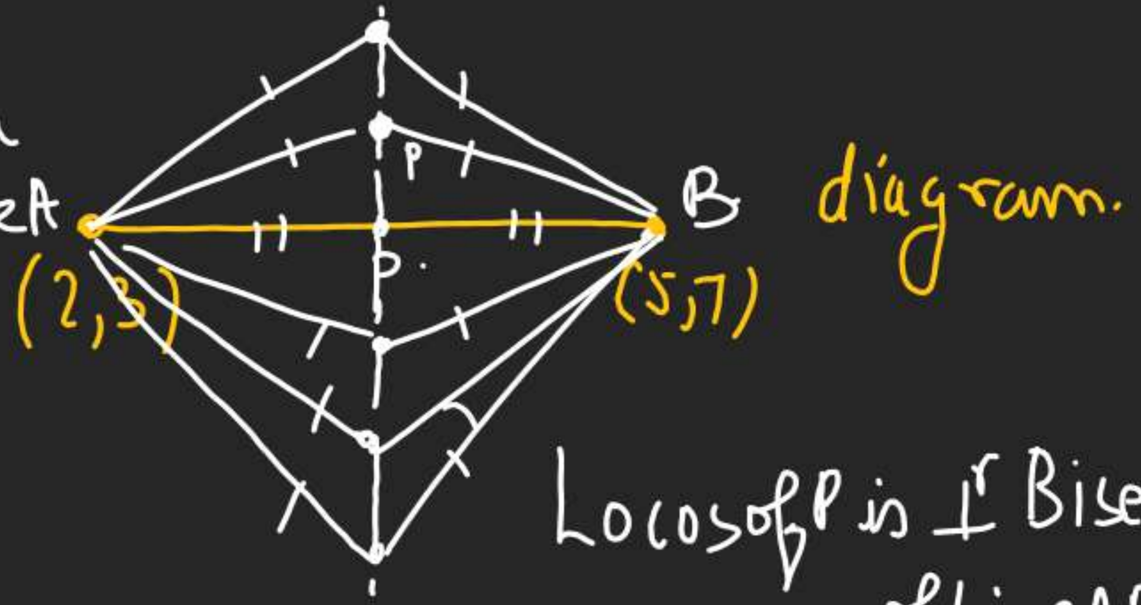
$\Rightarrow \sqrt{(h-2)^2+(K-3)^2} = \sqrt{(h-5)^2+(K-7)^2}$

$\Rightarrow h^2+K^2-4h-6K+13 = h^2+K^2-10h-14K+74$

$6h+8K = 61$

$6x+8y = 61$ is locus.

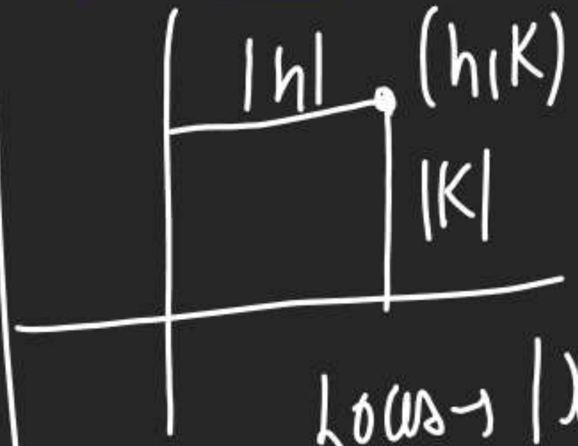
Extra Note



Locus of P is ⊥r Bisector of Line AB

Q6 Find locus of a Pt. Whose Sum of distances from 2 ⊥r lines is 1 Unit.

↑ से Axes लेना hint है



$|h|+|K| = 1$

Locus → $|x|+|y| = 1$

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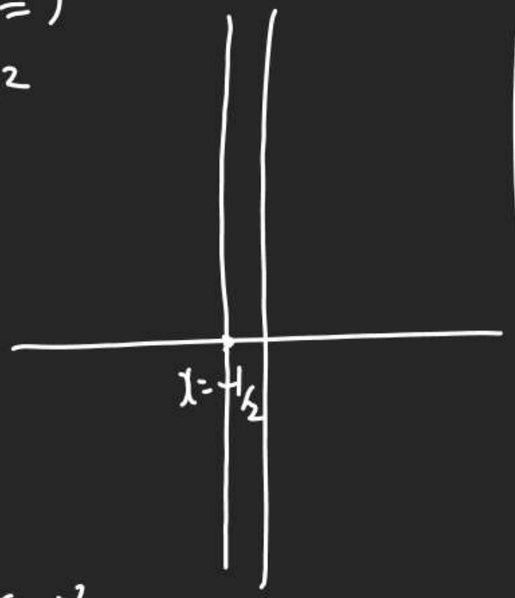
Q If P(1,0), Q(−1,0), R(2,0) then find locus of a Pt S, such that $SQ^2 + SR^2 = 2SP^2$

A) Line ∥ to x Axis
B) Line ⊥ to y Axis
C) Circle (D) NOT.



① let S = (h, K)

$(SQ)^2 + (SR)^2 = 2(SP)^2$

$(h+1)^2 + (K-0)^2 + (h-2)^2 + (K-0)^2 = 2\{(h-1)^2 + (K-0)^2\}$

$h^2 + 2h + 1 + K^2 + h^2 - 4h + 4 + K^2 = 2h^2 - 4h + 4 + 2K^2$

$2h + 5 = 4 \Rightarrow h = -1/2 \Rightarrow x = -1/2$

Q Find locus of a Pt. S such that sum of its distance from (0,2) & (0,−2) is 6.

① Let Pt (h, K)

② $\sqrt{(h-0)^2 + (K-2)^2} + \sqrt{(h-0)^2 + (K+2)^2} = 6$

$\sqrt{h^2 + (K-2)^2} = 6 - \sqrt{h^2 + (K+2)^2}$

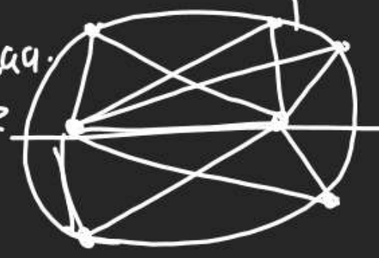
$h^2 + (K-2)^2 = 36 + h^2 + (K+2)^2 - 12\sqrt{h^2 + (K+2)^2}$

$K^2 - 4K + 4 = 36 + K^2 + 4K + 4 - 12\sqrt{h^2 + (K+2)^2}$

$3\sqrt{h^2 + (K+2)^2} = 2K + 9$

$9(h^2 + K^2 + 4K + 4) = 4K^2 + 81 + 36K$

Q $9x^2 + 5y^2 = 45$



Ellipse