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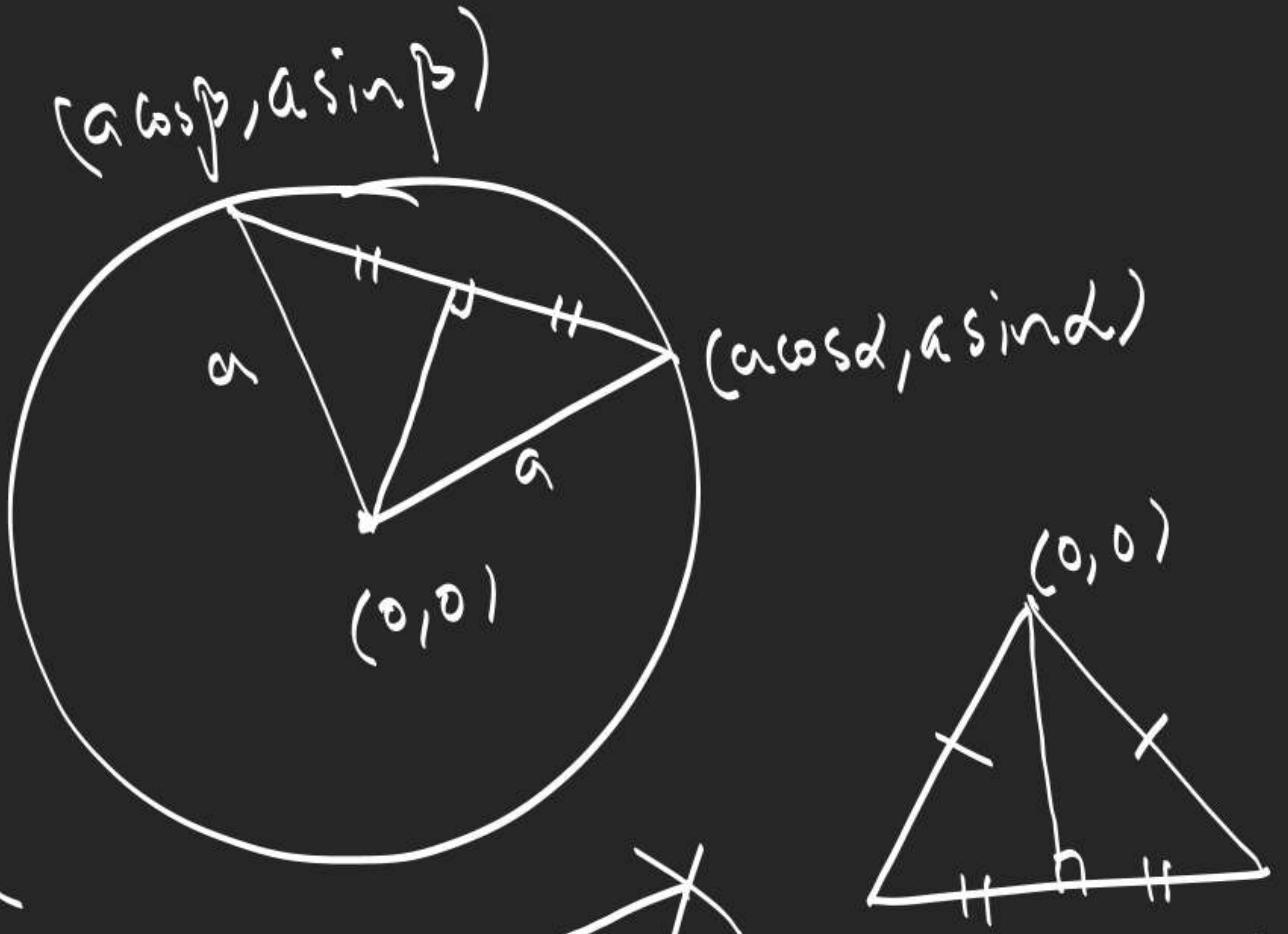

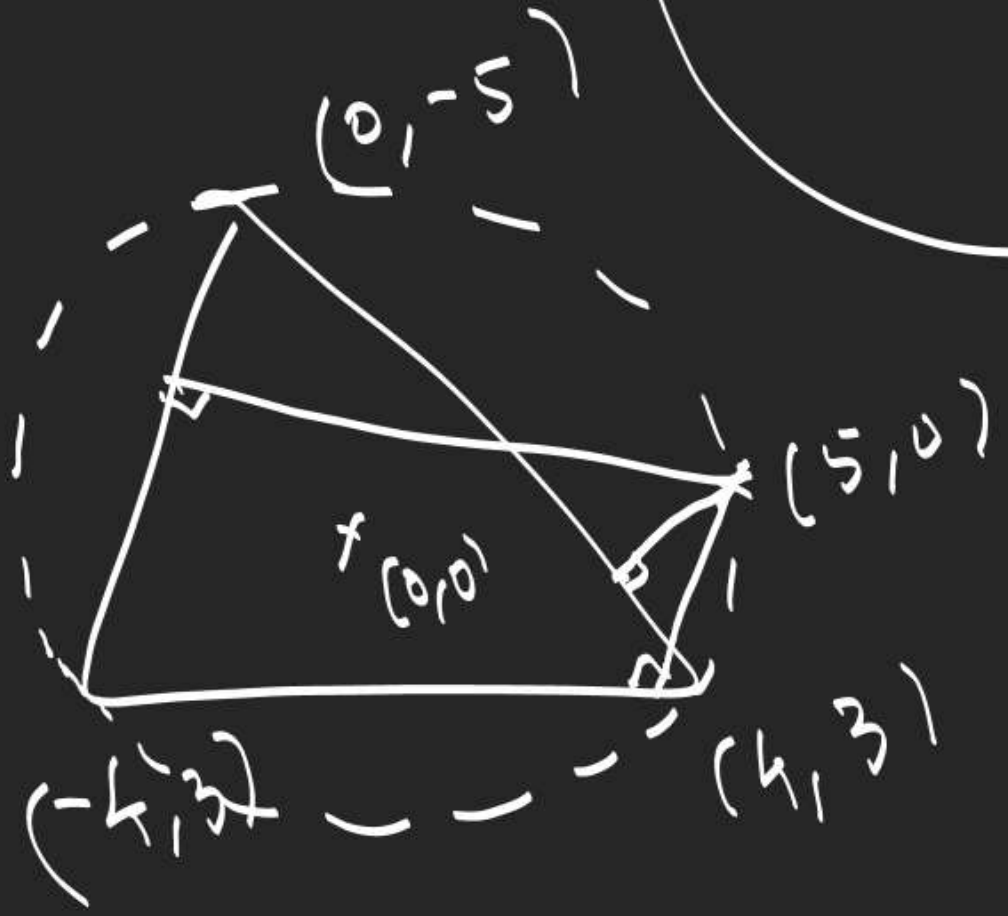

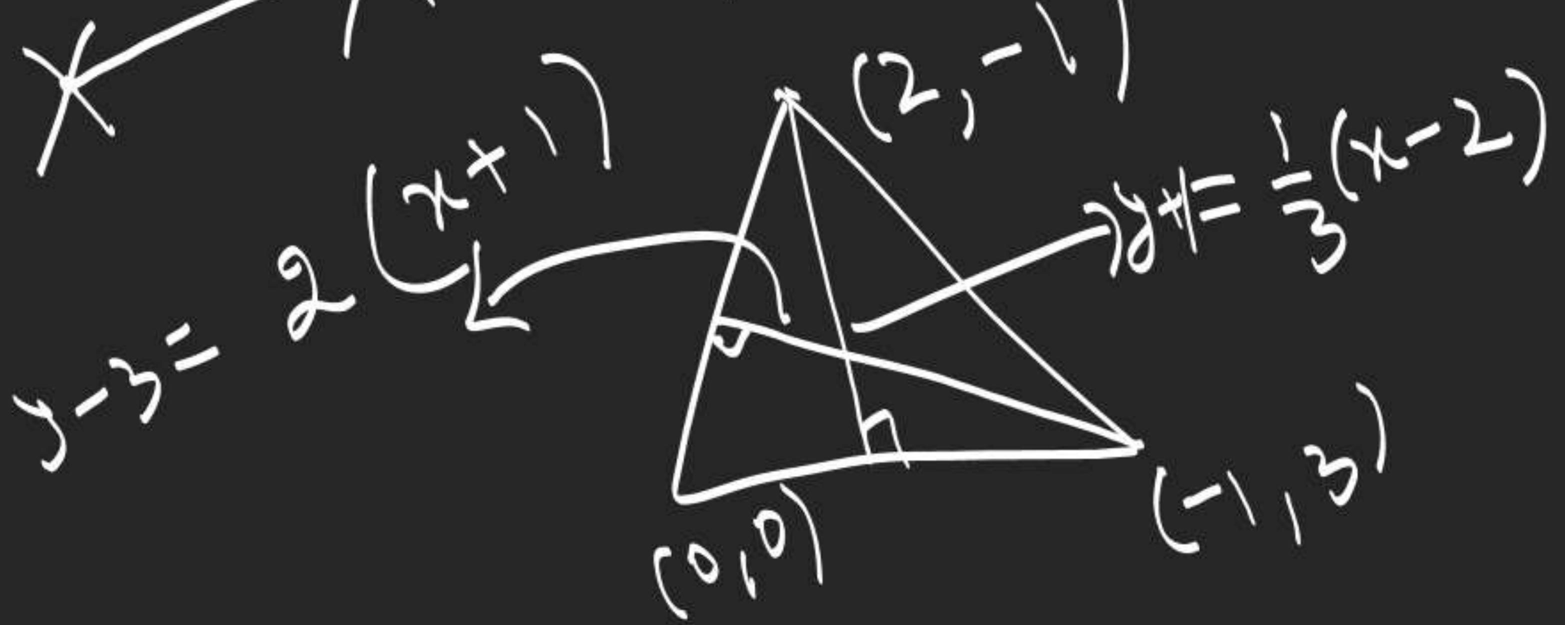

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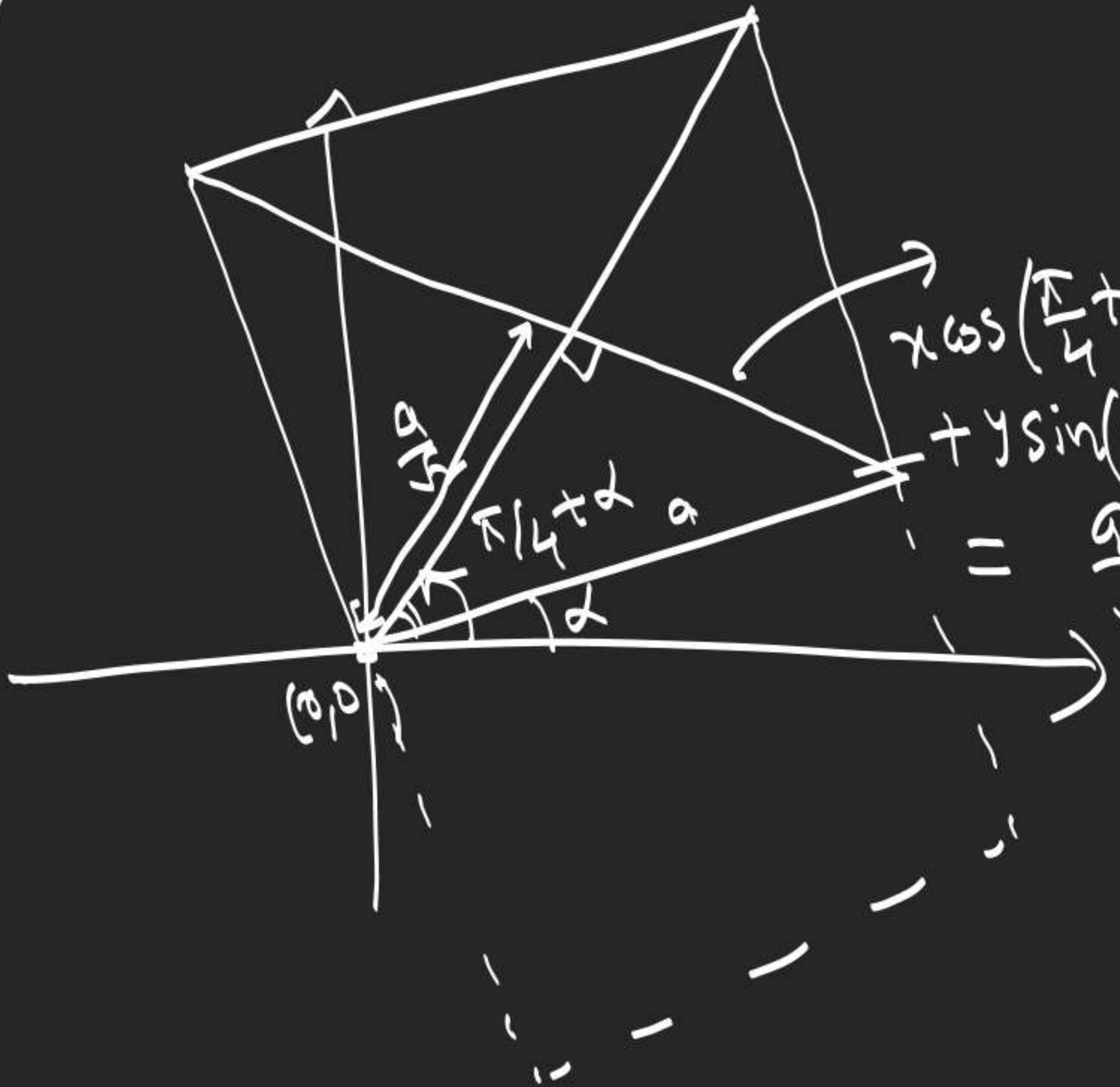

$$x\cos\left(\frac{\pi}{4}+\alpha\right)+y\sin\left(\frac{\pi}{4}+\alpha\right)=\frac{a}{\sqrt{2}}$$

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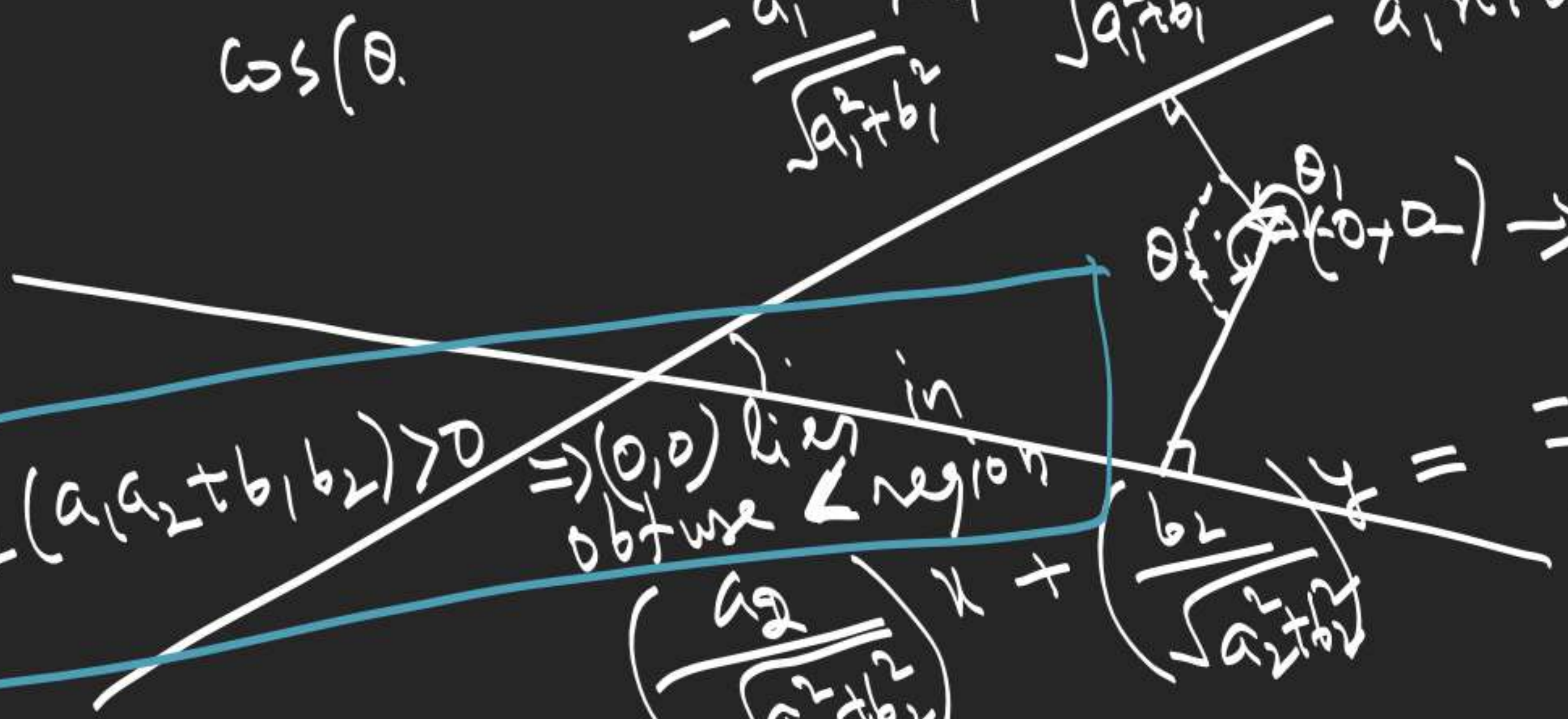
$c_1 c_2 \neq 0$

$\cos(\theta$

$$-\frac{a_1}{\sqrt{a_1^2+b_1^2}}x + \frac{-b_1 y}{\sqrt{a_1^2+b_1^2}} = \frac{c_1}{\sqrt{a_1^2+b_1^2}}$$

$a_1x+b_1y+c_1=0$



θ_1, θ, $(0, 0)$

$(0,0) \rightarrow \theta_2-\theta_1$ is obtuse.

$$\boxed{c_1c_2(a_1a_2+b_1b_2)>0} \Rightarrow (0,0) \text{ lies in obtuse } \angle \text{ region}$$

$$\left(\frac{a_2}{\sqrt{a_2^2+b_2^2}}\right)x + \left(\frac{b_2}{\sqrt{a_2^2+b_2^2}}\right)y = \frac{-c_2}{\sqrt{a_2^2+b_2^2}}$$

$a_2x+b_2y+c_2=0$

Condition for origin to lie in acute angle region

$$\boxed{c_1c_2(a_1a_2+b_1b_2)<0}$$

$\cos(\theta_2-\theta_1)<0 \Rightarrow \cos\theta_1\cos\theta_2+\sin\theta_1\sin\theta_2<0$

$c_1c_2<0,\ a_1a_2+b_1b_2>0$

$c_1c_2>0,\ a_1a_2+b_1b_2<0$

$c_1>0,\ c_2<0 \Rightarrow \dfrac{-a_1a_2-b_1b_2}{\sqrt{a_1^2+b_1^2}\sqrt{a_2^2+b_2^2}}<0$

$c_1<0,\ c_2>0$

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Find the eqn. of angle bisector of lines

$2x-3y=7$ & $4x+5y+6=0$

(i) containing (0,0) in its region. $\dfrac{2x-3y-7}{\sqrt{13}} = (-)\dfrac{4x+5y+6}{\sqrt{41}}$

(ii) containing (2,-3) in its region. $\dfrac{2x-3y-7}{\sqrt{13}} = (-)\dfrac{4x+5y+6}{\sqrt{41}}$

(iii) which is acute angle bisector $\dfrac{2x-3y-7}{\sqrt{13}} = (+)\dfrac{4x+5y+6}{\sqrt{41}}$

(iv) which is obtuse angle bisector $\dfrac{2x-3y-7}{\sqrt{13}} = (-)\dfrac{4x+5y+6}{\sqrt{41}}$

$c_1c_2(a_1a_2+b_1b_2)>0$

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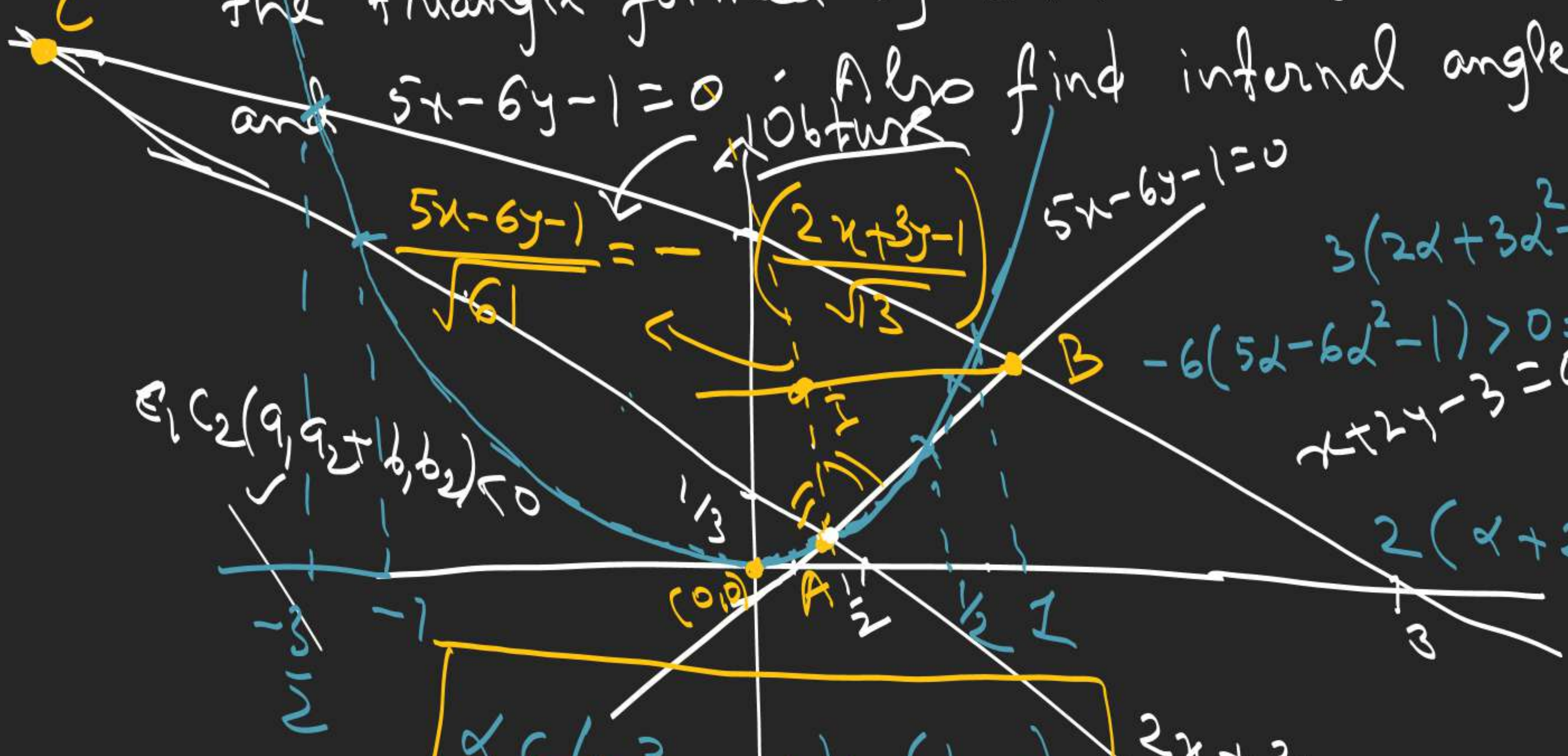
1. Find 'a' for which points (a, a^2) lies inside the triangle formed by lines $2x+3y-1=0$, $x+2y-3=0$ and $5x-6y-1=0$. Also find internal angle bisectors of triangle.



$3(2\alpha+3\alpha^2-1)>0 \Rightarrow \alpha\in(-\infty,-1)\cup(\frac{1}{3},\infty)$

$-6(5\alpha-6\alpha^2-1)>0 \Rightarrow 6\alpha^2-5\alpha+1>0$

$\Rightarrow \alpha\in(-\infty,\frac{1}{3})\cup(\frac{1}{2},\infty)$

$2(\alpha+2\alpha^2-3)<0$

$\Rightarrow \alpha\in(-\frac{3}{2},1)$

$$\boxed{\alpha\in\left(-\frac{3}{2},-1\right)\cup\left(\frac{1}{2},1\right)}$$

$3\alpha^2+3\alpha-\alpha-1$

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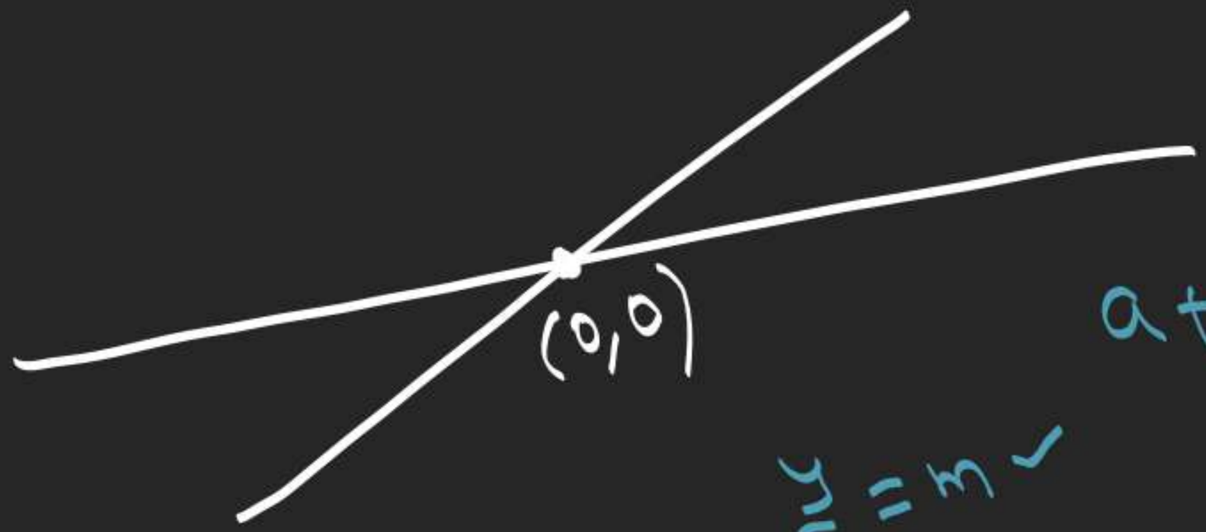
Pair of lines passing through origin



$$\boxed{ax^2 + 2hxy + by^2 = 0} \rightarrow \text{2 degree homogeneous eqn.}$$

$$a + 2h\left(\frac{y}{x}\right) + b\left(\frac{y}{x}\right)^2 = 0$$

$\frac{y}{x} = m$

$$a + 2hm + bm^2 = 0$$

$m = \text{const} \begin{cases} m_1 \\ m_2 \end{cases}$

$\frac{y}{x} = m_1, m_2$

$y = m_1 x$

$$2m^2 - 3m + 1 = 0$$

$\frac{y}{x} = i$

$\frac{y}{x} = -i$

} Imaginary lines.

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$$a_n x^n + a_{n-1}x^{n-1}y + a_{n-2}x^{n-2}y^2 + \dots + a_1 x y^{n-1} + a_0 y^n = 0 \longrightarrow a_i \in R.$$

$\downarrow$

n lines thru origin.

$$a_0\left(\frac{y}{x}\right)^n + a_1\left(\frac{y}{x}\right)^{n-1} + a_2\left(\frac{y}{x}\right)^{n-2} + \dots + a_{n-1}\frac{y}{x} + a_n = 0$$

$$a_0 m^n + a_1 m^{n-1} + \dots + a_{n-1} m + a_n = 0$$

Ex-8 $\rightarrow$ 38, 42, 43, 45

Ex-I (1-10)

$\downarrow$

sheet.