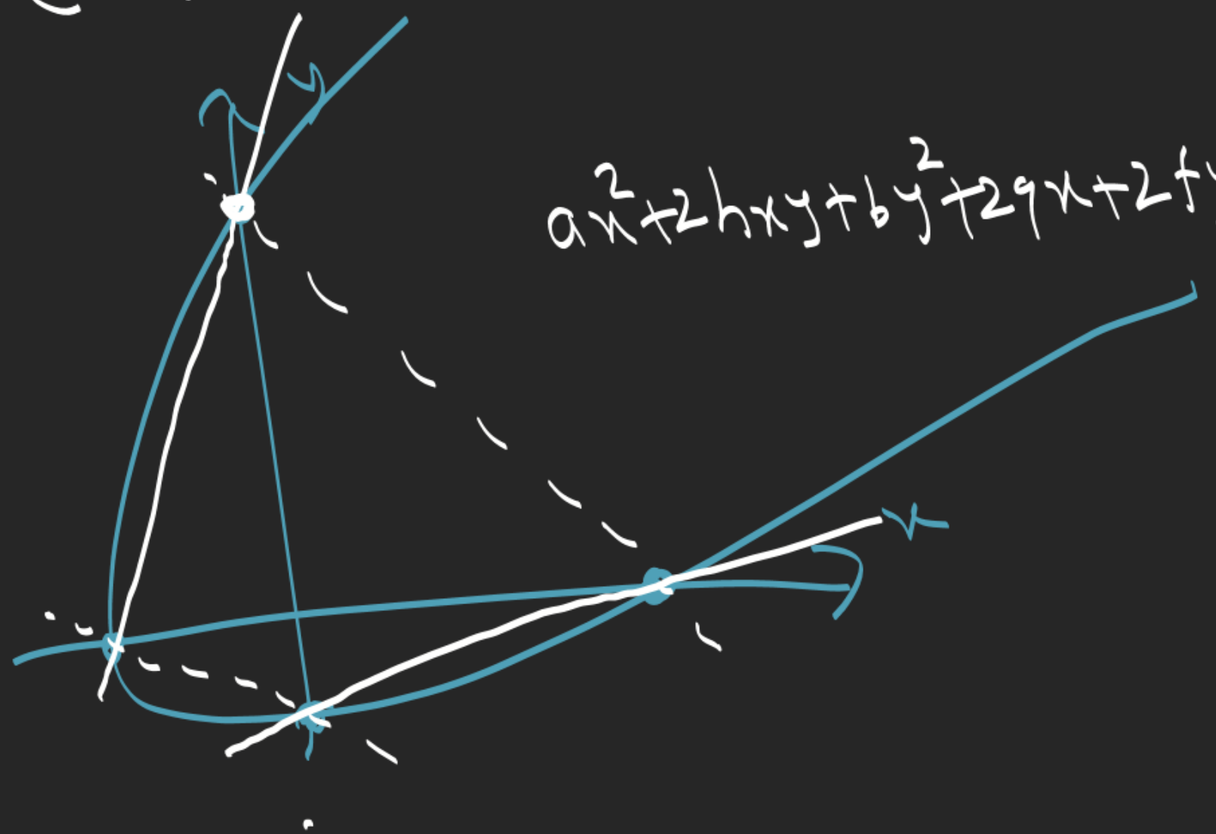
Nishant Jindal

Given: a two degree curve 'C' : $ax^2+2hxy+by^2+2gx+2fy+c=0$

To find: family of 2 degree curves thru intersection of 'C' with coordinate axes.



$ax^2+2hxy+by^2+2gx+2fy+c+\lambda xy=0$

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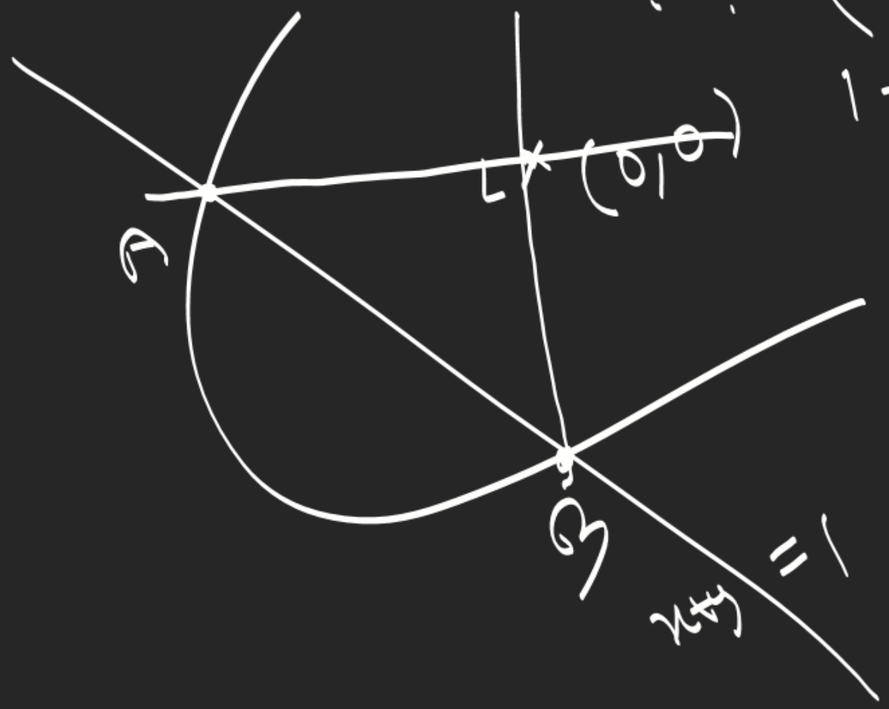
1. Find 'm' if the lines joining the origin to the points common to $x^2+y^2+x-2y-m=0$ & $x+y=1$ are at right angles.



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

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

$$x^2+y^2+x-2y-m=0$$

$$m=\frac{1}{2}$$

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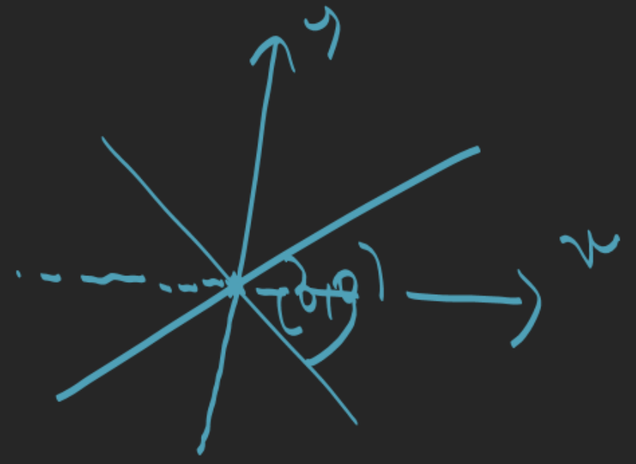
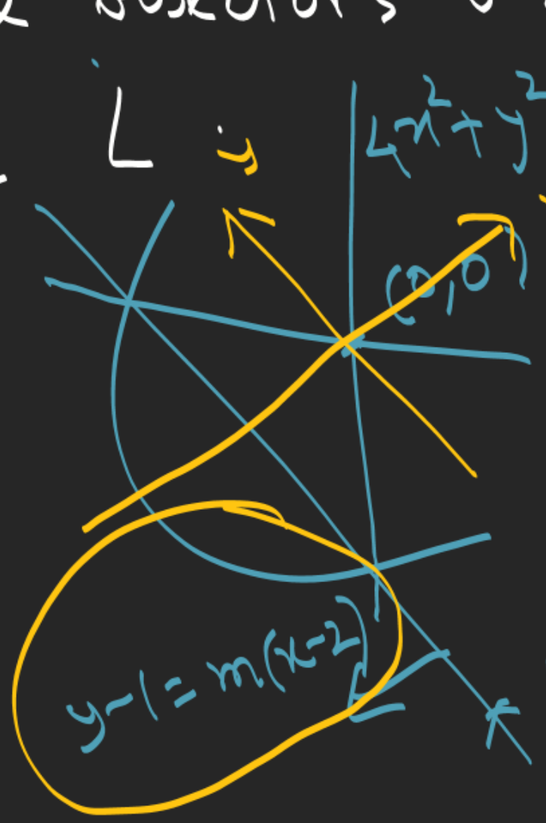
2. A line 'L' passing thru point (2,1) intersects the curve $4x^2+y^2-x+4y-2=0$ at points A, B. If the lines joining origin and the points A, B are such that coordinate axes are bisectors between them. Find the eqn. of line L.





$$4x^2+y^2-(x-4y)\frac{(y-mx)}{(1-2m)}-2\frac{(y-mx)^2}{(1-2m)^2}=0$$

$$\frac{-1-4m}{1-2m}+\frac{4m}{(1-2m)^2}=0$$

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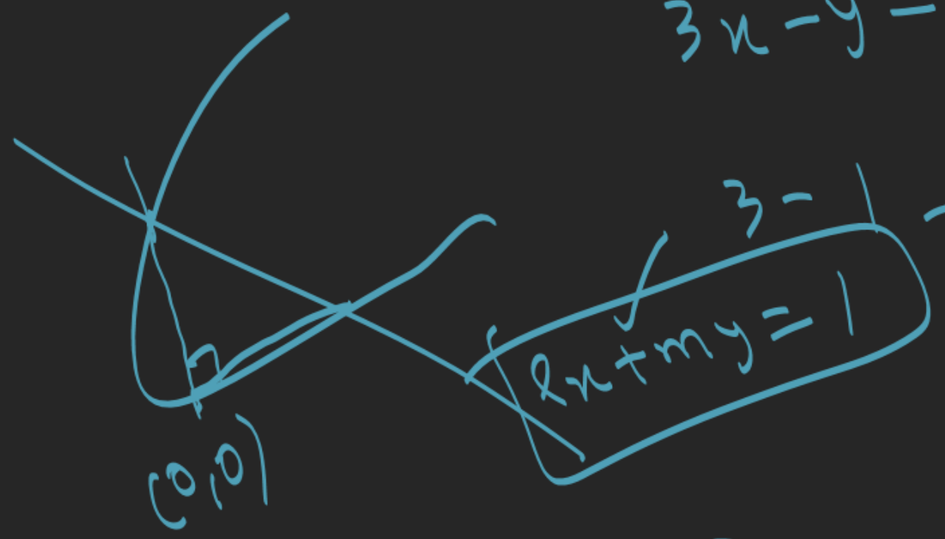
3. Show that all chords of the curve $3x^2 - y^2 - 2x + 4y = 0$ subtending right angle at origin pass thru a fixed point.



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

$$3 - l - 2l + 4m = 0$$

$$l - 2m = 1$$

$$(1, -2)$$