

Hom # 9.4-2 part

28 $x^2 + 4xy + y^2 - 3 = 0$

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

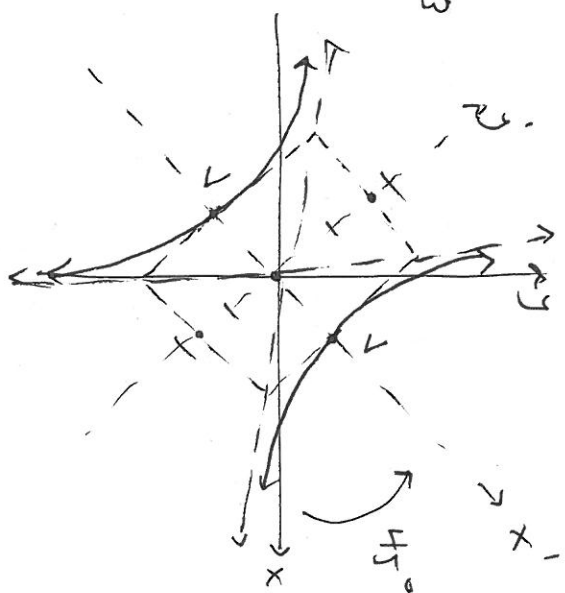
$$\left(\frac{2x^2 - 4xy + 2y^2}{4}\right) + 4\left(\frac{2x^2 - 2y^2}{4}\right) + \left(\frac{2x^2 + 4xy + 2y^2}{4}\right) = 3$$

$$2x^2 - 4xy + 2y^2 + 4(2x^2 - 2y^2) + 2x^2 + 4xy + 2y^2 = 12$$

$$2x^2 - 4xy + 2y^2 + 8x^2 - 8y^2 + 2x^2 + 4xy + 2y^2 = 12$$

$$12x^2 - 4y^2 = 12$$

$$\boxed{\frac{(x')^2}{3} - \frac{(y')^2}{3} = 1}$$



30 $5x^2 - 8xy + 5y^2 - 9 = 0$

$$5\left(\frac{\sqrt{2}x - \sqrt{2}y}{2}\right)^2 - 8\left(\frac{\sqrt{2}x - \sqrt{2}y}{2}\right)\left(\frac{\sqrt{2}x + \sqrt{2}y}{2}\right) + 5\left(\frac{\sqrt{2}x + \sqrt{2}y}{2}\right)^2 = 9$$

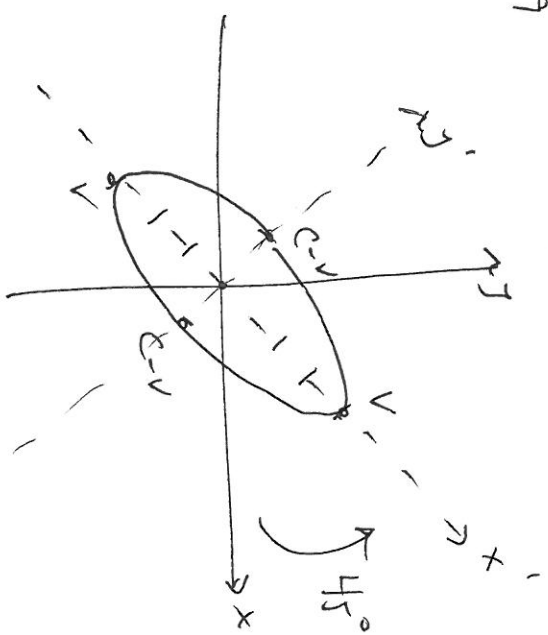
$$5\left(\frac{2x^2 - 4xy + 2y^2}{4}\right) - 8\left(\frac{2x^2 - 2y^2}{4}\right) + 5\left(\frac{2x^2 + 4xy + 2y^2}{4}\right) = 9$$

$$5(2x^2 - 4xy + 2y^2) - 8(2x^2 - 2y^2) + 5(2x^2 + 4xy + 2y^2) = 36$$

$$10x^2 - 20xy + 10y^2 - 16x^2 + 16y^2 + 10x^2 + 20xy + 10y^2 = 36$$

$$4x^2 + 36y^2 = 36$$

$$\boxed{\frac{(x')^2}{9} + \frac{(y')^2}{1} = 1}$$



$$(31) \quad 11x^2 + 10\sqrt{3}xy + y^2 - 4 = 0$$

$$11 \left(\frac{\sqrt{3}x - y}{2} \right)^2 + 10\sqrt{3}xy \left(\frac{\sqrt{3}x - y}{2} \right) \left(\frac{x + \sqrt{3}y}{2} \right) + \left(\frac{x + \sqrt{3}y}{2} \right)^2 = 4$$

$$11 \left(\frac{3x^2 - 2\sqrt{3}xy + y^2}{4} \right) + 10\sqrt{3}xy \left(\frac{\sqrt{3}x^2 + 2xy - \sqrt{3}y^2}{4} \right) + \left(\frac{x^2 + 2\sqrt{3}xy + 3y^2}{4} \right) = 4$$

$$11(3x^2 - 2\sqrt{3}xy + y^2) + 10\sqrt{3}xy(\sqrt{3}x^2 + 2xy - \sqrt{3}y^2) + x^2 + 2\sqrt{3}xy + 3y^2 = 16$$

$$33x^2 - 22\sqrt{3}xy + 11y^2 + 30x^2 + 20\sqrt{3}xy - 30y^2 + x^2 + 2\sqrt{3}xy + 3y^2 = 16$$

$$64x^2 - 16y^2 = 16$$

$$\frac{4x^2}{1} - \frac{y^2}{1} = 1$$

$$\boxed{\frac{(x')^2}{\frac{1}{4}} - \frac{(y')^2}{1} = 1}$$

