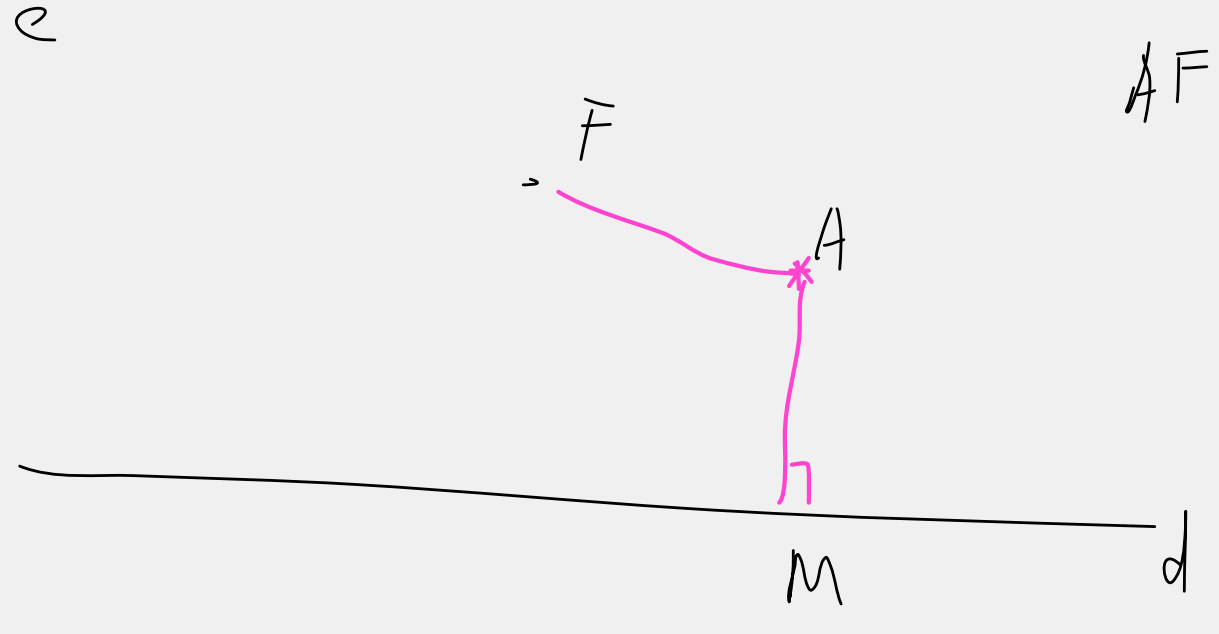
e

AF = AM e

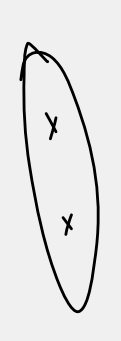


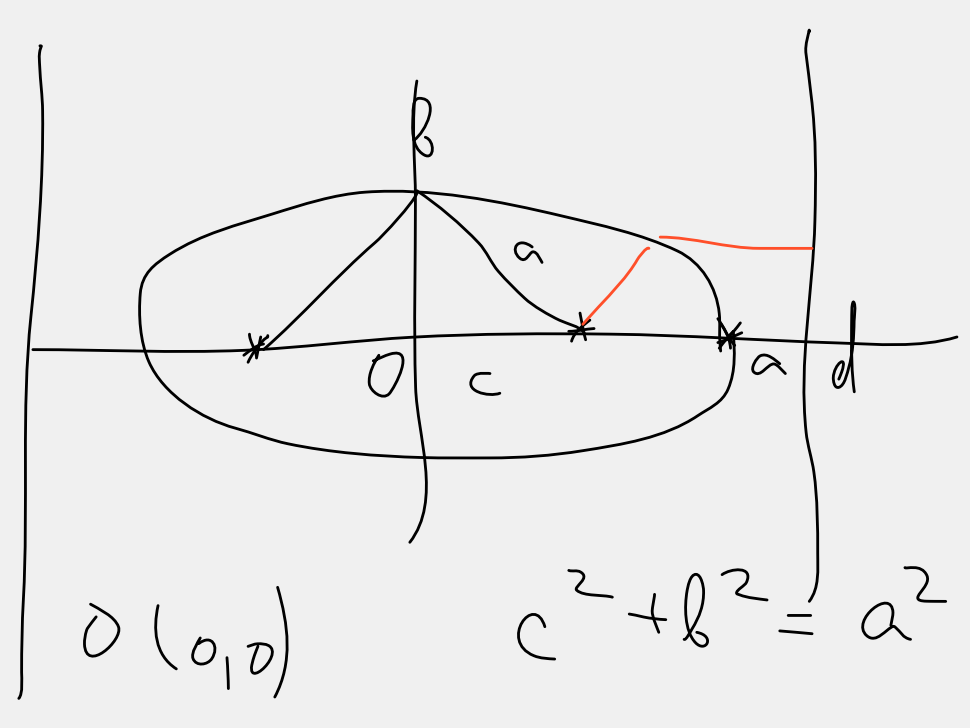
$\frac{x^2}{a^2} \pm \frac{y^2}{b^2} = 1$ $\quad y = 2px^2$ $\quad c^2 = a^2 - b^2$

$e = \frac{c}{a} = \frac{\sqrt{a^2-b^2}}{a} = \sqrt{1 - \frac{b^2}{a^2}}$

$-x^2 + y^2 = 1$ $\quad y = 4x^2$

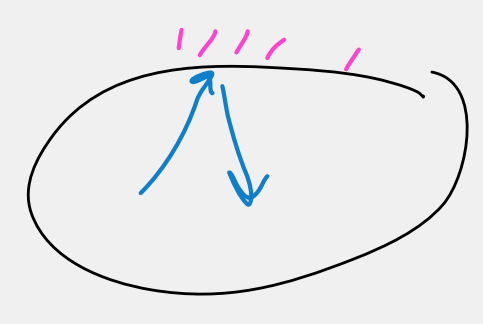
$x^2 - y^2 = 1$ $\quad y = 2\ 2\ x^2$ $\quad a - c = (d - a)\ e$ $\quad d = \frac{a}{e}$





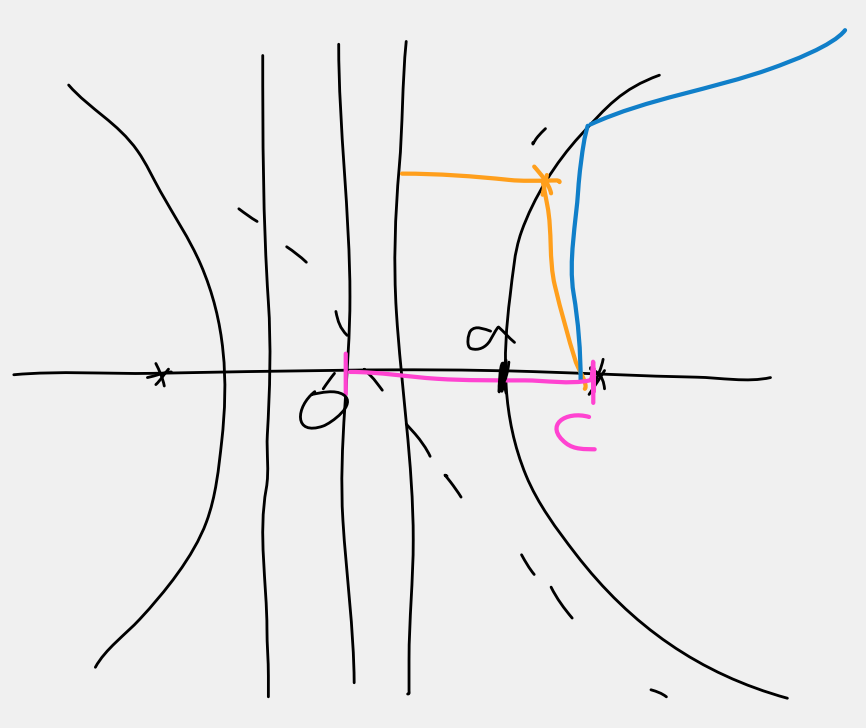
$c^2 + b^2 = a^2$

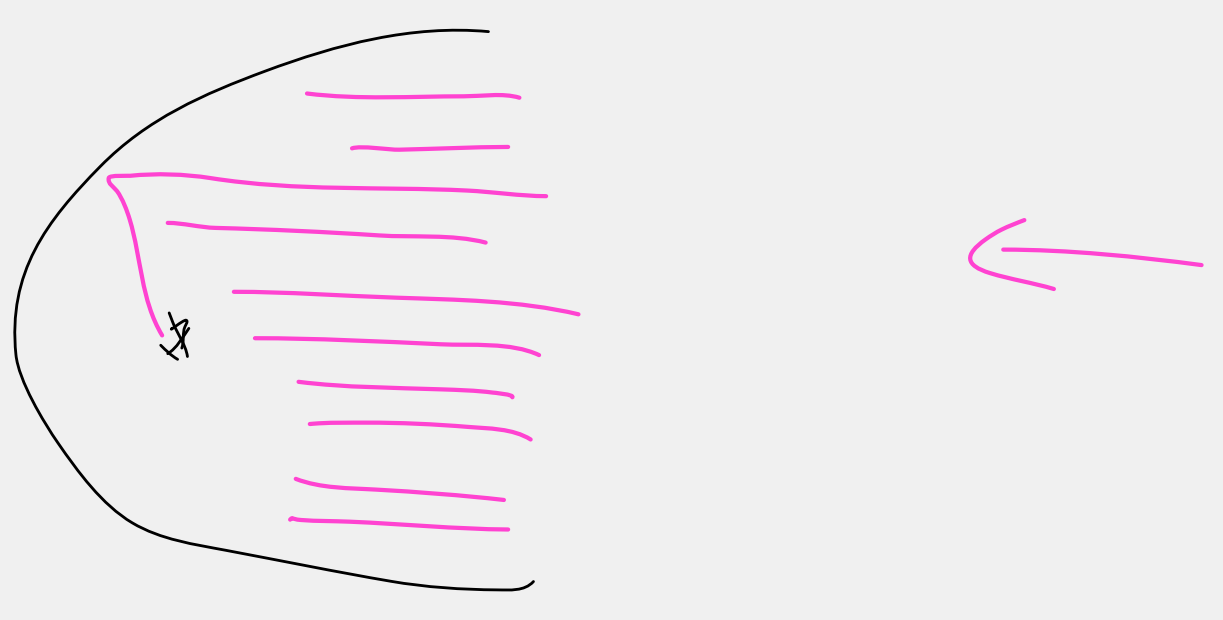
2a



$e = \frac{c}{a}$

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



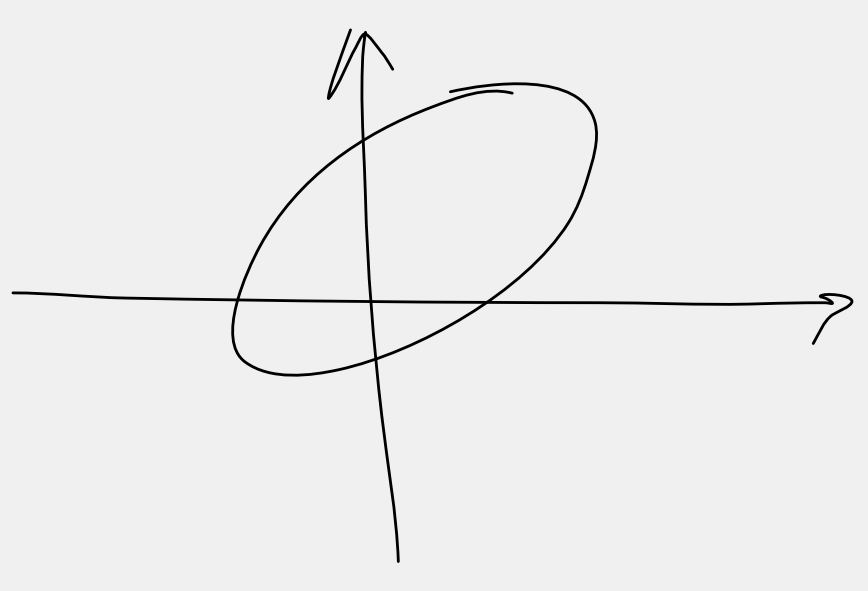


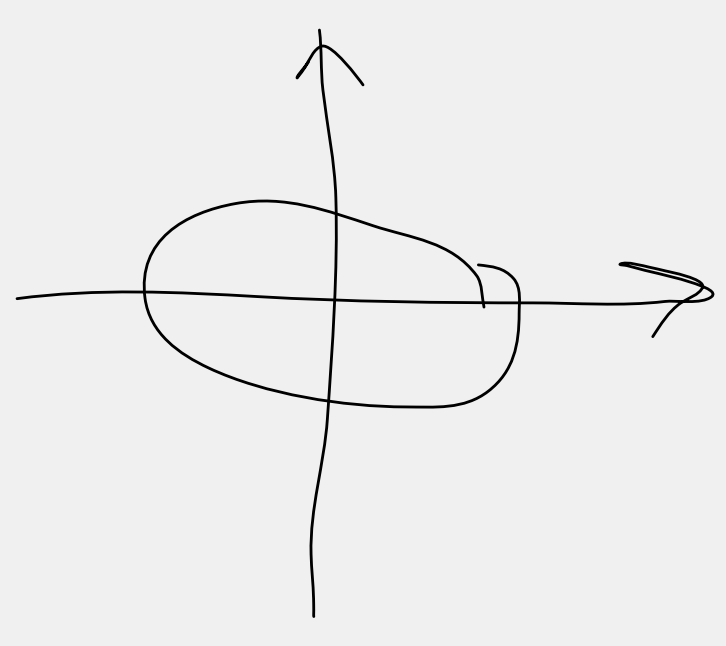
$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

$Ax + By + C = 0$

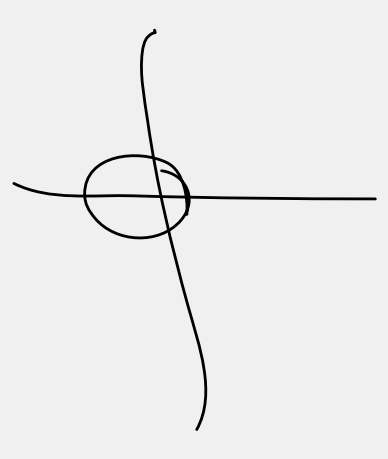
$a_1 x^2 + 2a_{12}xy + a_{22}y^2 \quad x \quad y \quad 1 = 0$

$(ax + by + c)(dx + ey + f) = 0$





$x^2 + 2x - 1 + y^2 = 0$



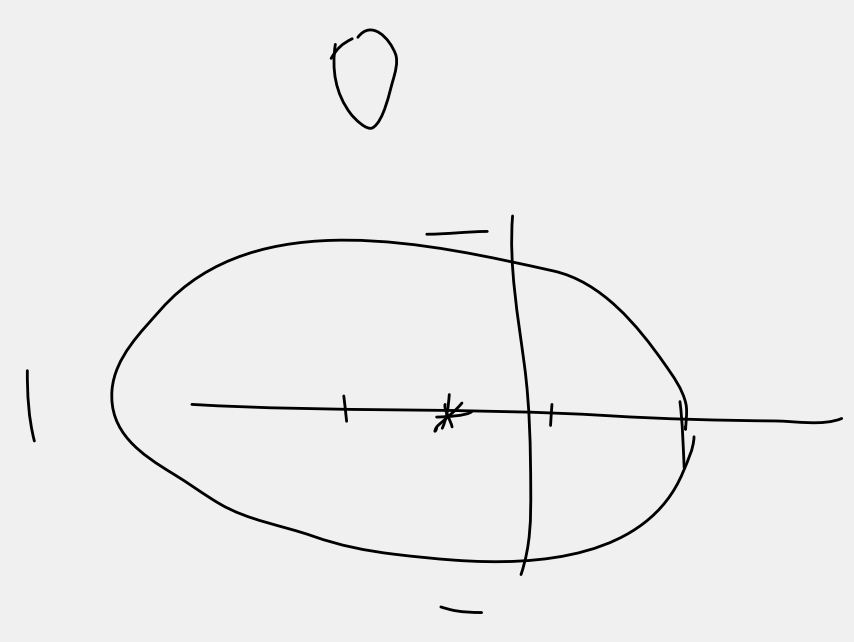
$(x+1)^2 + y^2 = 2$

$2x^2 + 2x - 1 + y^2 = 0$ $\qquad a^2 + 2ab + b^2$

$2\left(x^2 + x\ 2\ \frac{1}{2} + 1/4\right) - 1/2 - 1 + y^2 = 0$

$a^2 \quad a\ 2\ b$

$2\left(x + 1/2\right)^2 + y^2 = 3/2$



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

$\frac{(x + 1/2)^2}{3} + \frac{y^2}{3/2} = 1$

$\sqrt{3}, \quad \sqrt{3/2}$

$\underbrace{x^2 \quad \cancel{x} \quad 1} \quad \underbrace{y^2 \quad \cancel{y} \quad 1} \quad xy = 0$

$(x-\alpha)^2 + (y-\beta)^2 + \gamma$

$a_{11}x^2 + 2a_{12}xy + a_{22}y^2 + a_{33} = 0$

$$\begin{array}{cccc} & x & y & 1 \\ x & a_{11} & a_{12} & * \\ y & a_{12} & a_{22} & \\ 1 & * & & a_{33} \end{array} \qquad \begin{pmatrix} 1/a^2 & 0 & 0 \\ 0 & 1/b^2 & 0 \\ 0 & 0 & -1 \end{pmatrix}$$

$$A = \begin{pmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{pmatrix}$$

$J_1 = a_{11} + a_{22} = const$

$J_2 = \begin{vmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{vmatrix}$

$J_3 = |A|$

~~[illegible]~~ $J_2 > 0$ Елипс $\qquad \begin{pmatrix} 1 & & \\ & 1 & \\ & & 1 \end{pmatrix}$

$J_2 < 0$ хипер

$J_2 = 0$ парабола $\qquad x^2 + y^2 + 1 = 0$

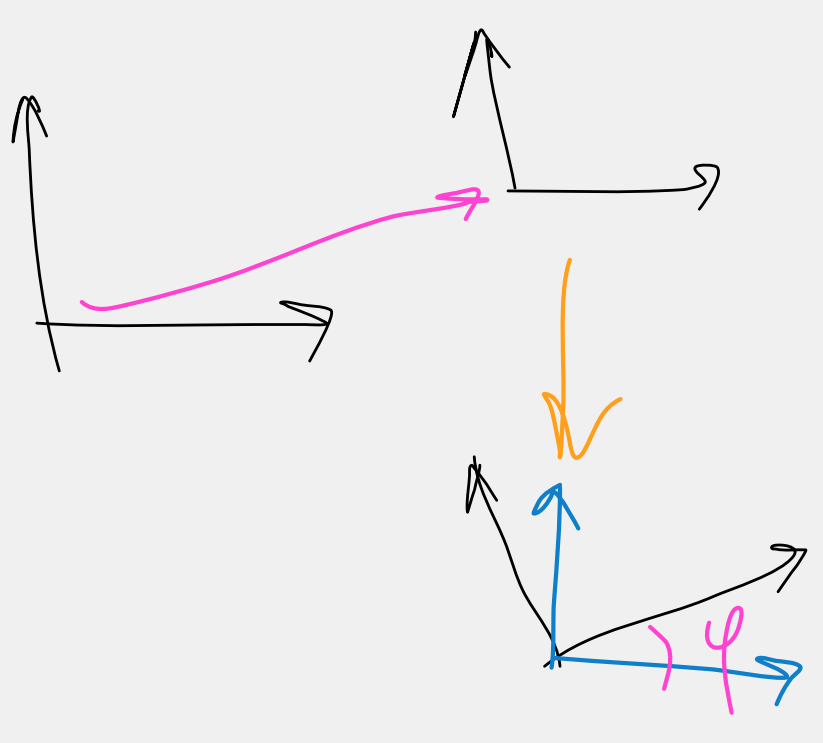
$$x^2 + 2x + 1 + y^2 - 1 = 0 \ (*) \rightarrow \begin{array}{cccc} & x & y & 1 \\ x & 1 & 0 & 1 \\ y & 0 & 1 & 0 \\ 1 & 1 & 0 & 0 \end{array} \qquad \begin{array}{l} J_1 = 2 \\ J_2 = 1 \\ J_3 = -1 \end{array}$$

$(x+1)^2 + y^2 - 1 = 0$

$Oxy \rightarrow Ox'y'$ $\qquad (0,0)$ в xy, $(1,0)$ в $x'y'$

$x' = x + 1$ $\qquad (x')^2 + (y')^2 - 1 = 0 \ (**)$ $\qquad \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{pmatrix}$ $\qquad J_1 = 2$, $J_2 = 1$, $J_3 = -1$

$y' = y$



~~xy~~

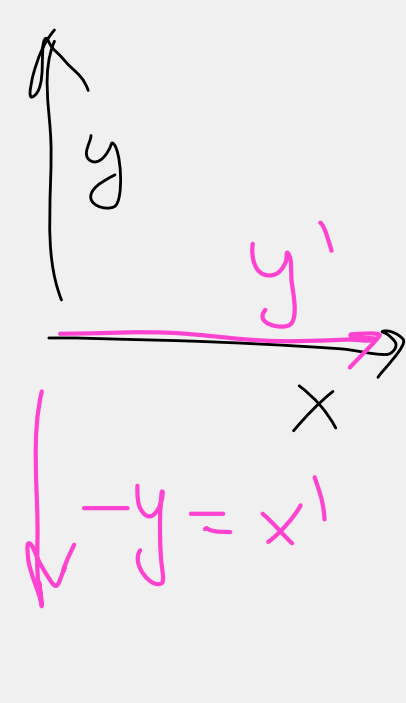
$2a_{12}xy$ $\qquad tg\, 2\varphi = \frac{a_{11} - a_{22}}{2a_{12}}$ $\qquad \sin\left(\frac{arctg \frac{17}{18}}{2}\right)$

$x' = \cos\varphi\ x - \sin\varphi\ y$

$y' = \sin\varphi\ x + \cos\varphi\ y$

$\varphi - 0$ $\quad x' = x$, $\quad y' = y$

$\varphi = \pi/2$ $\quad x' = -y$, $\quad y' = x$



$\underbrace{xy} \rightarrow x'y' \rightarrow \underbrace{x''y''}$