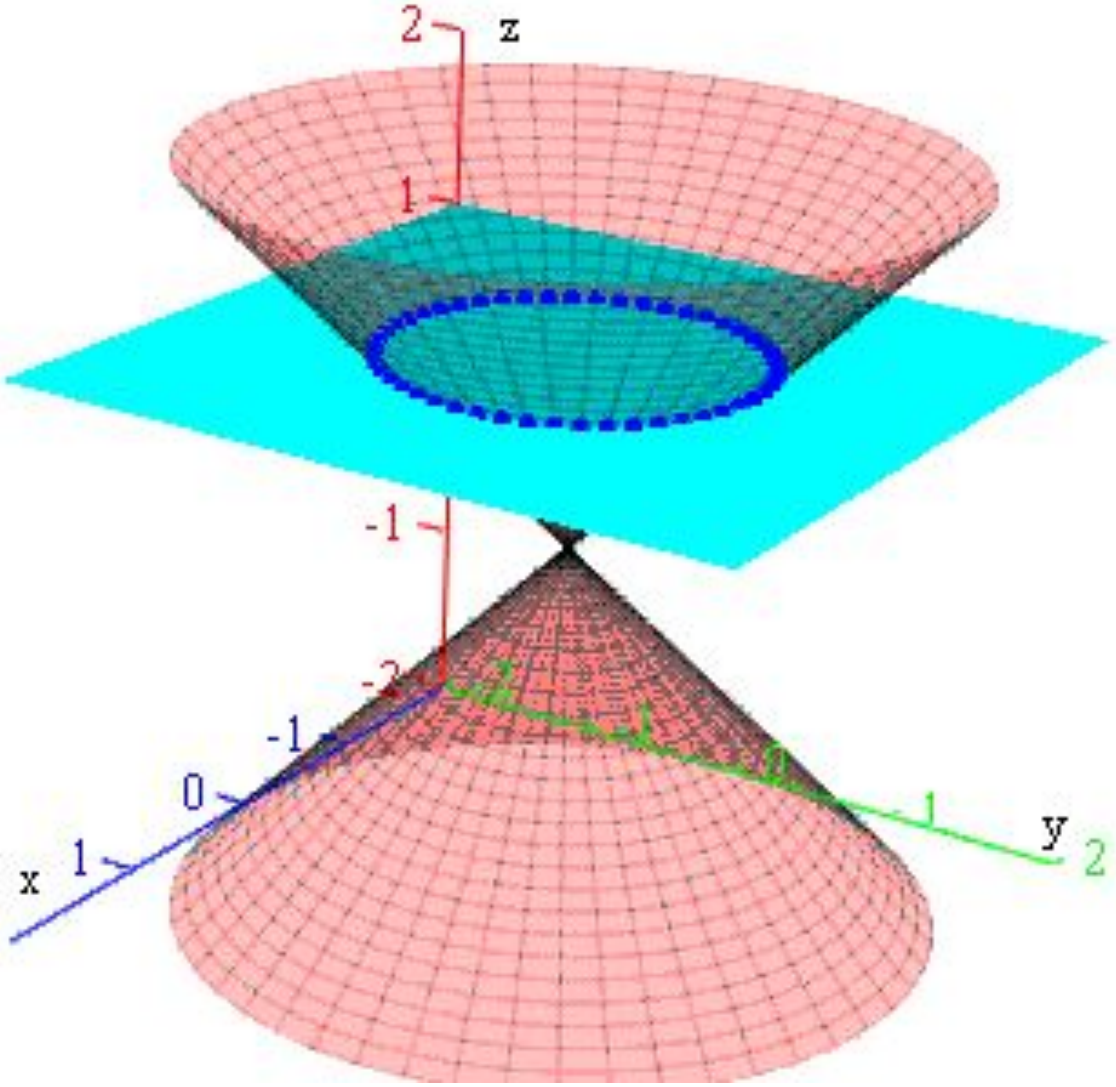
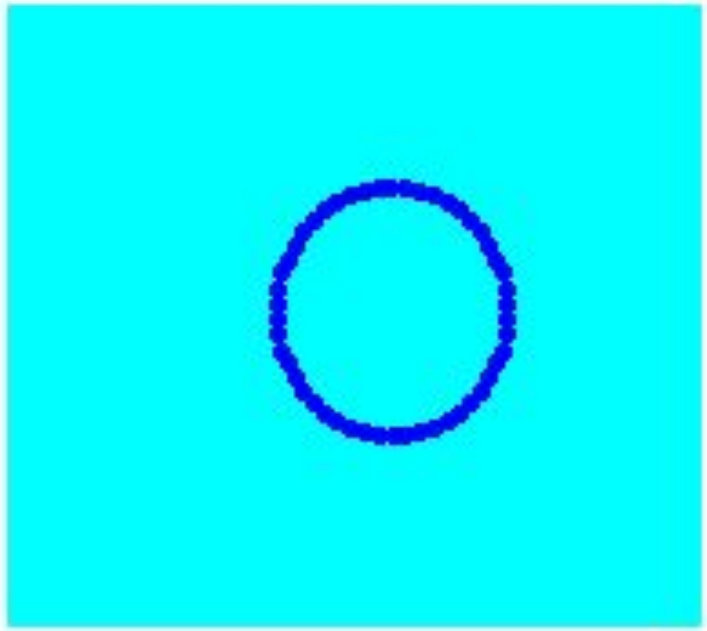
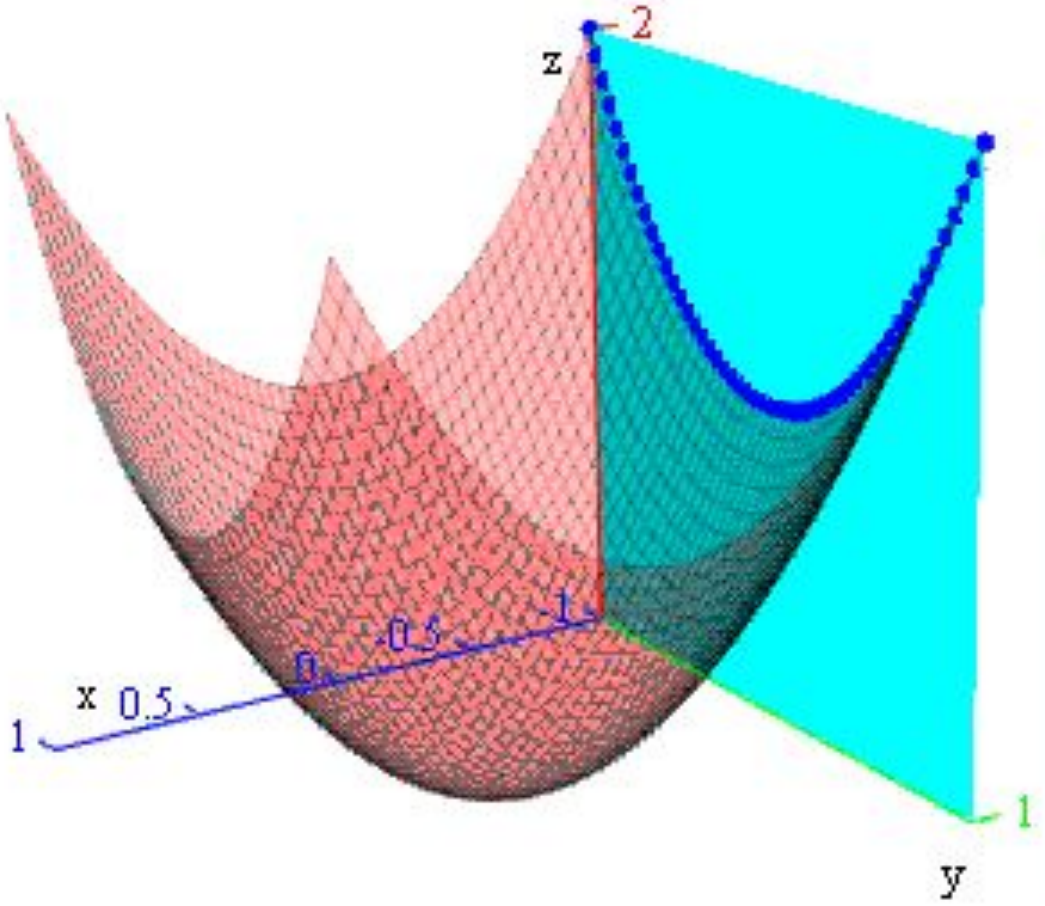
# Конические сечения


2
z
1
-1
-2
-1
0
1
x
1
y
2



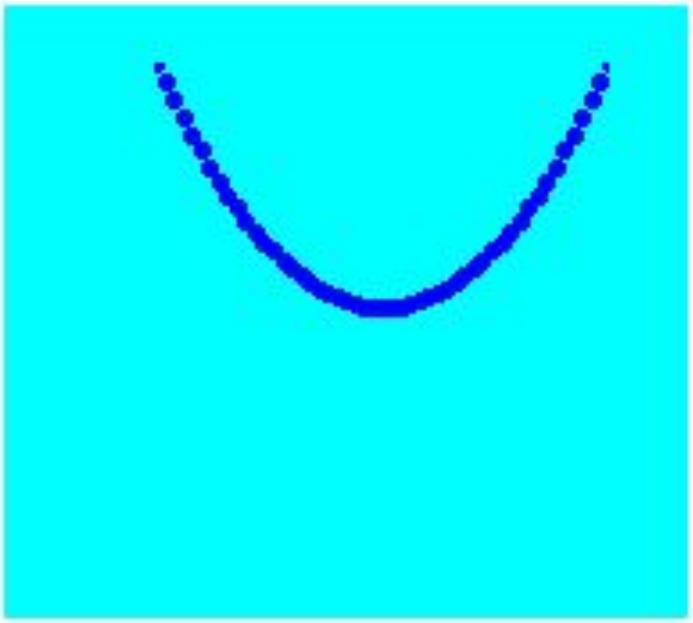
# Сечения эллиптического параболоида

# плоскостью x = const

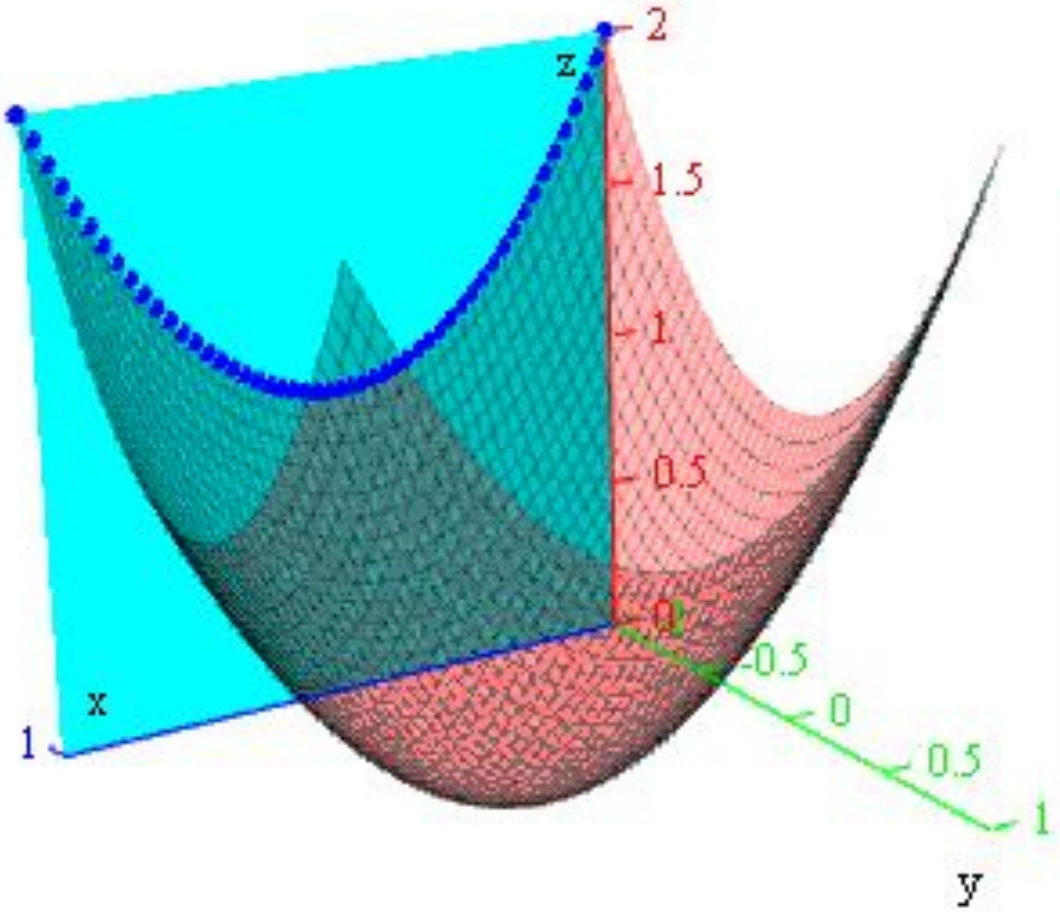



Elliptic paraboloid $x^2 - y^2 = z$

intersecting the plane $x = -1$

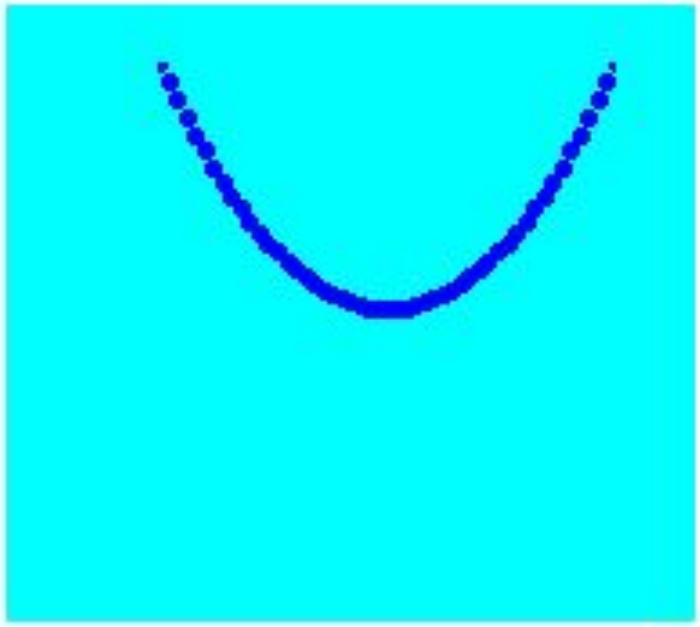


# плоскостью y = const

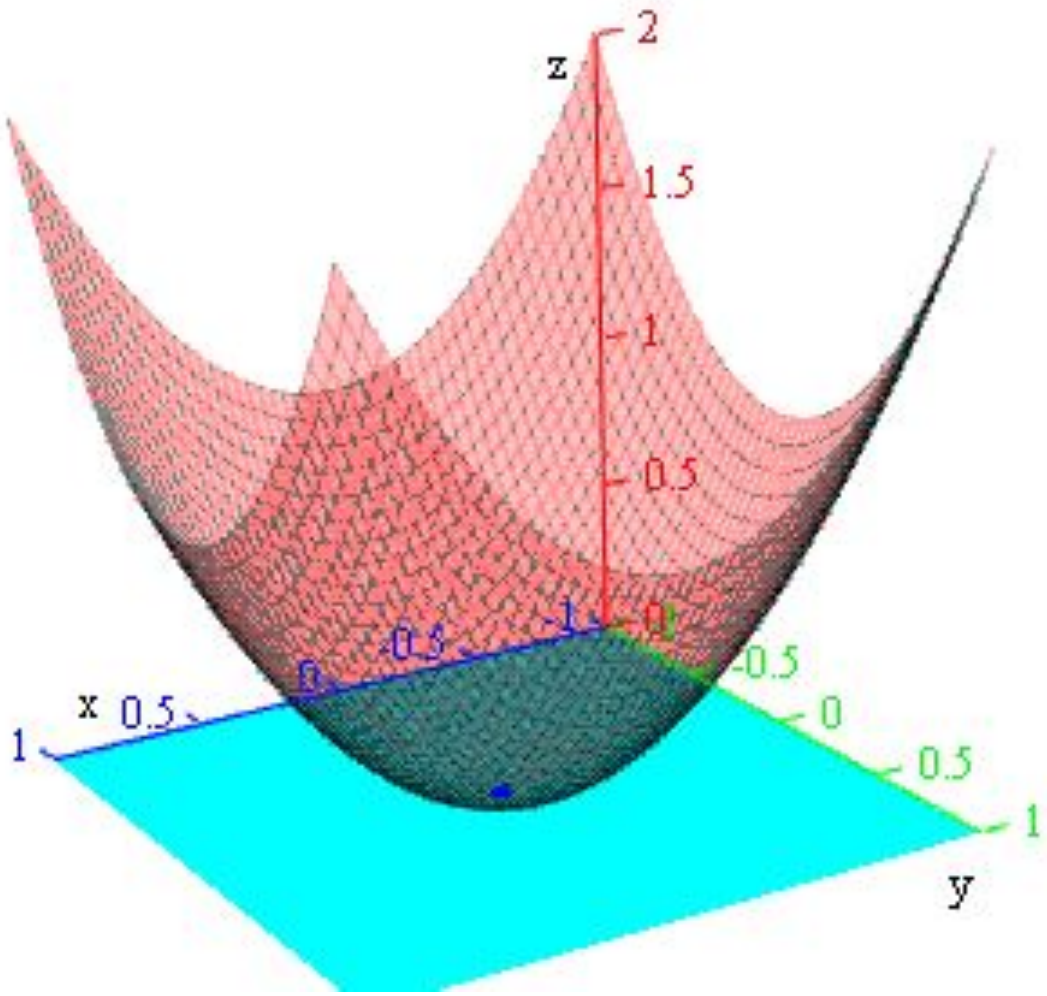



Elliptic paraboloid $x^2 - y^2 = z$

intersecting the plane $y = -1$

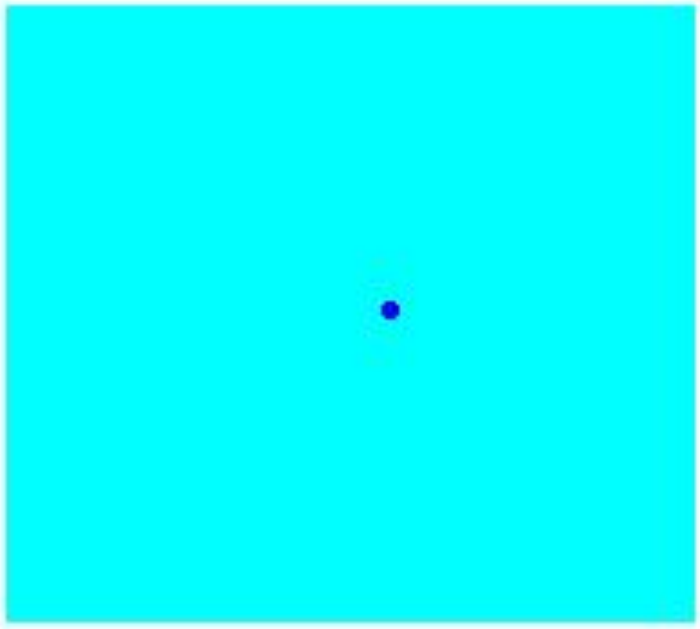


# плоскостью z = const



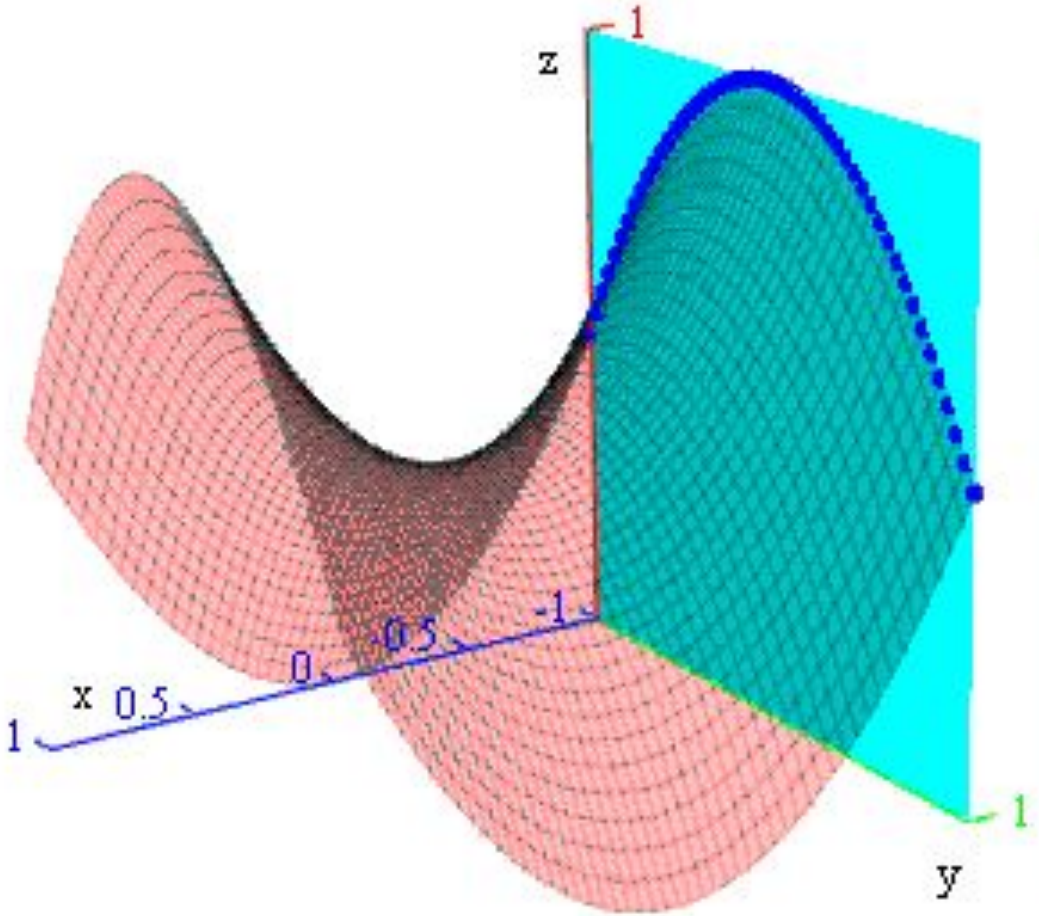

Elliptic paraboloid $x^2 - y^2 = z$

intersecting the plane $z = 0$



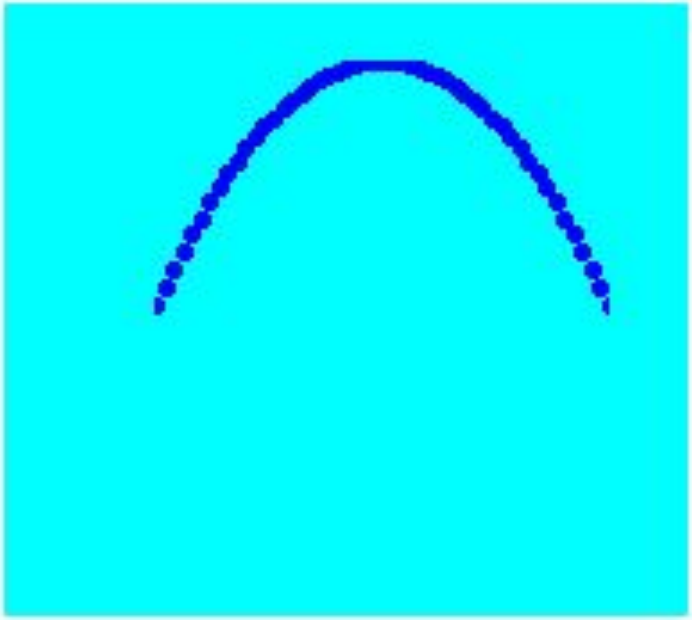
# Сечения гиперболического параболоида

# плоскостью x = const

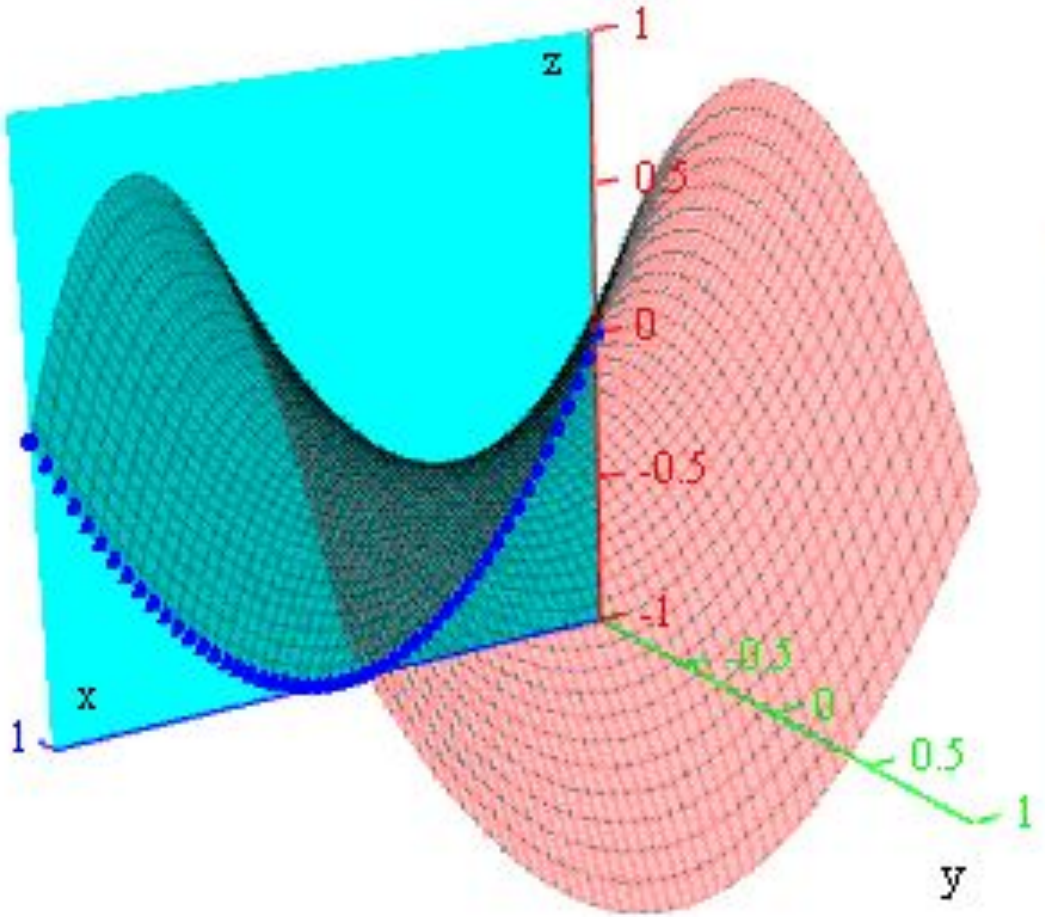



Hyperbolic paraboloid $x^2 - y^2 = z$

intersecting the plane $x = -1$

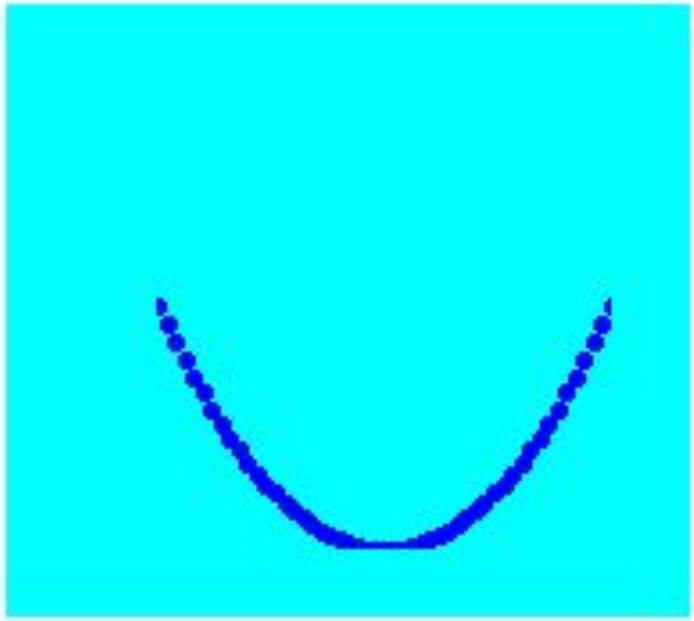


# плоскостью y = const

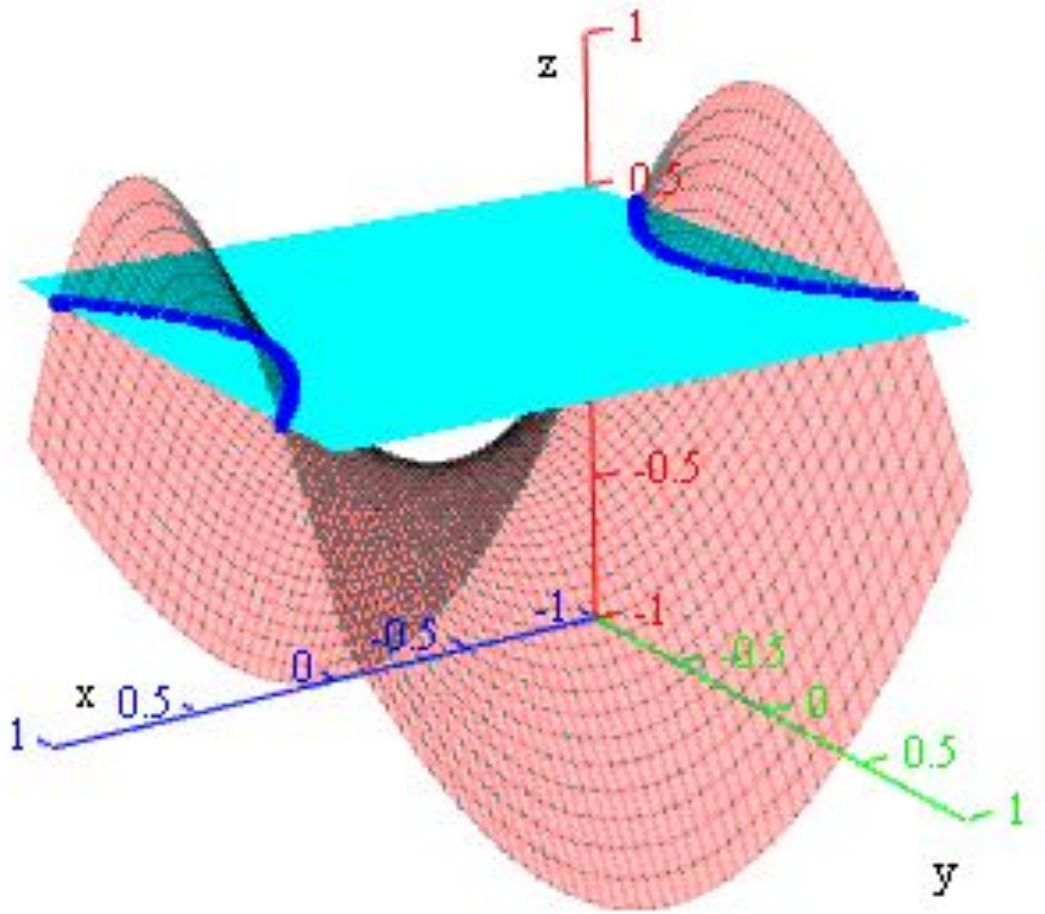



Hyperbolic paraboloid $x^2 - y^2 = z$

intersecting the plane $y = -1$

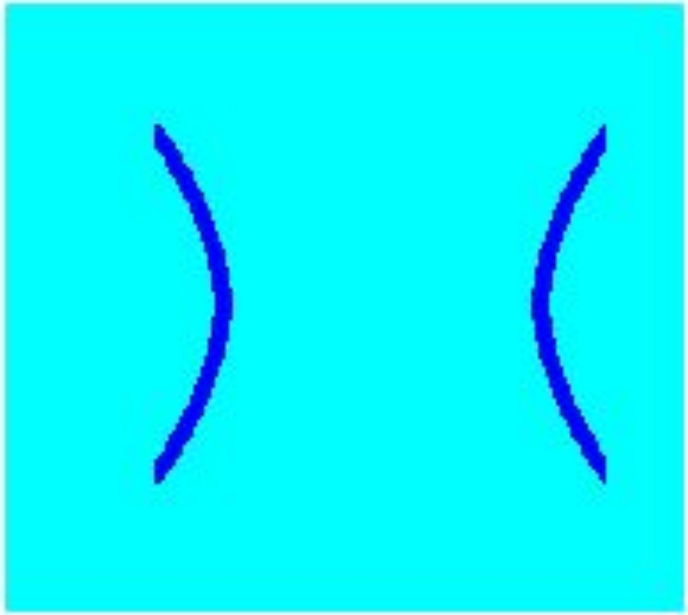


# плоскостью z = const

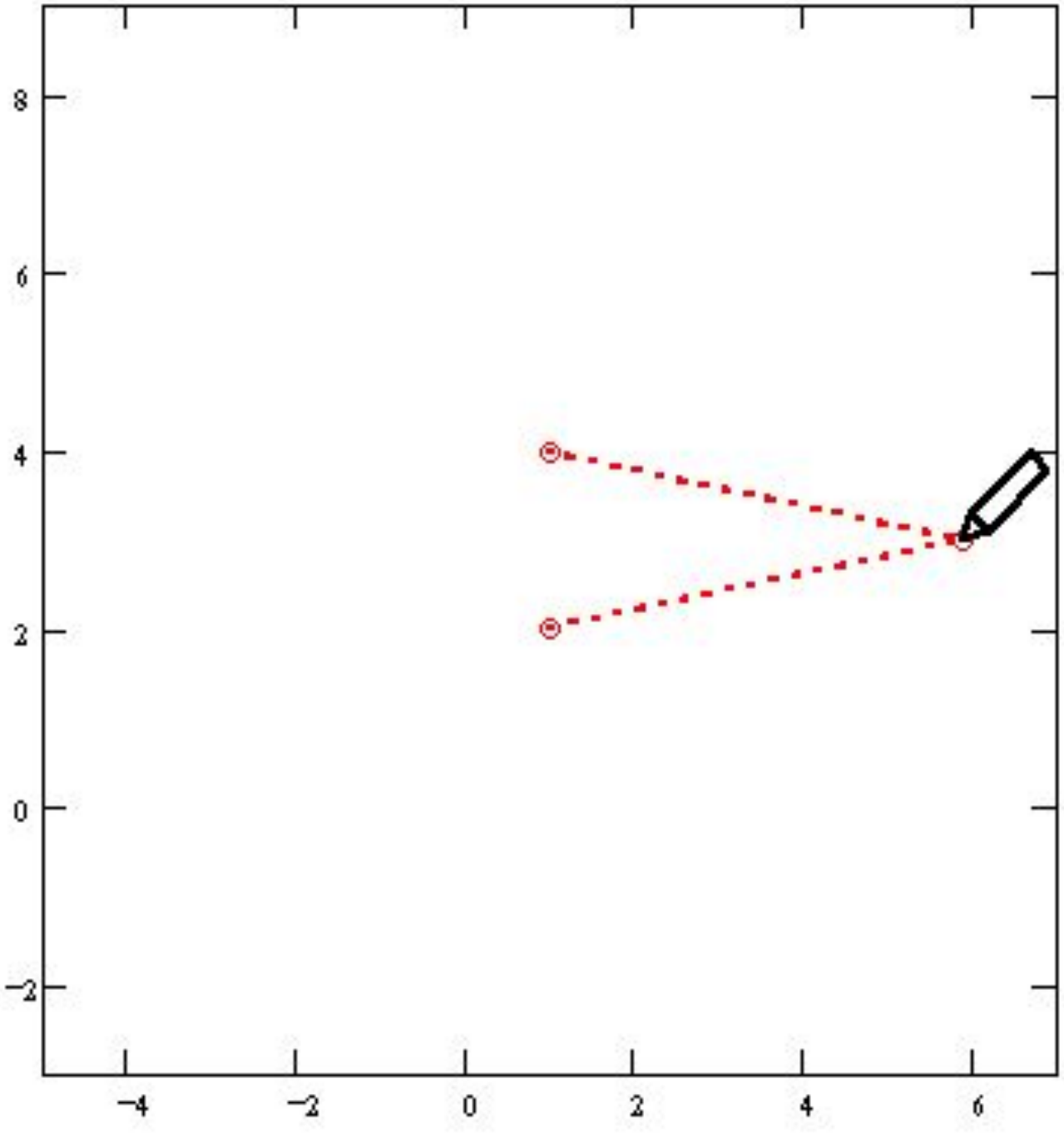



Hyperbolic paraboloid $x^2 - y^2 = z$

intersecting the plane $z = 0.5$



# Рисуем эллипс




$$\frac{(x-1)^2}{24}+\frac{(y-3)^2}{25}=1$$

Distance to the left focus:

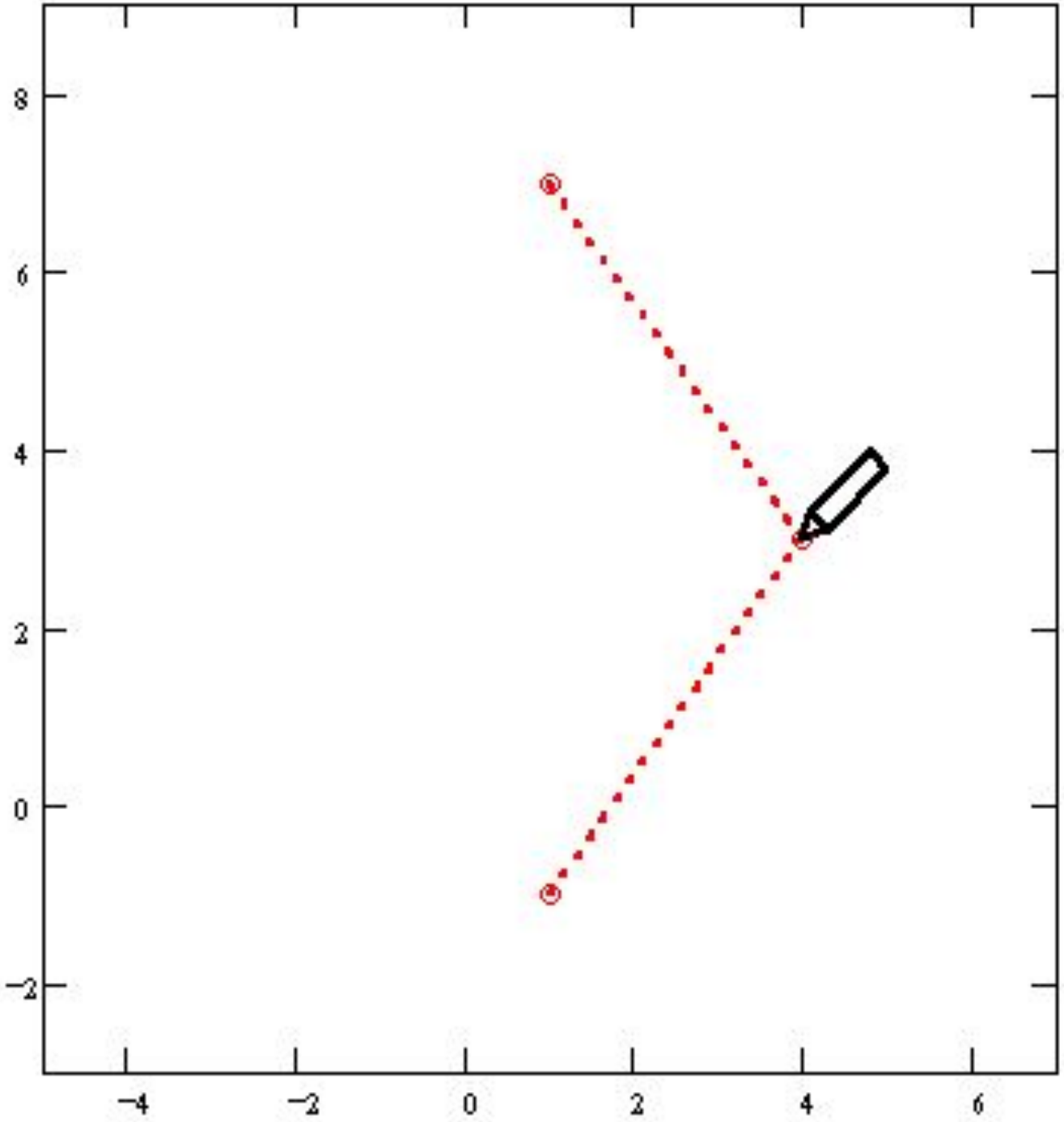
$$D_1\left(R_F, T_F\right)=5$$

Distance to the right focus:

$$D_2\left(R_F, T_F\right)=5$$

Sum of the distances:

$$2\cdot a=10$$




$$\frac{(x-1)^2}{9}+\frac{(y-3)^2}{25}=1$$

Distance to the left focus:

$$D_1\left(R_F, T_F\right)=5$$

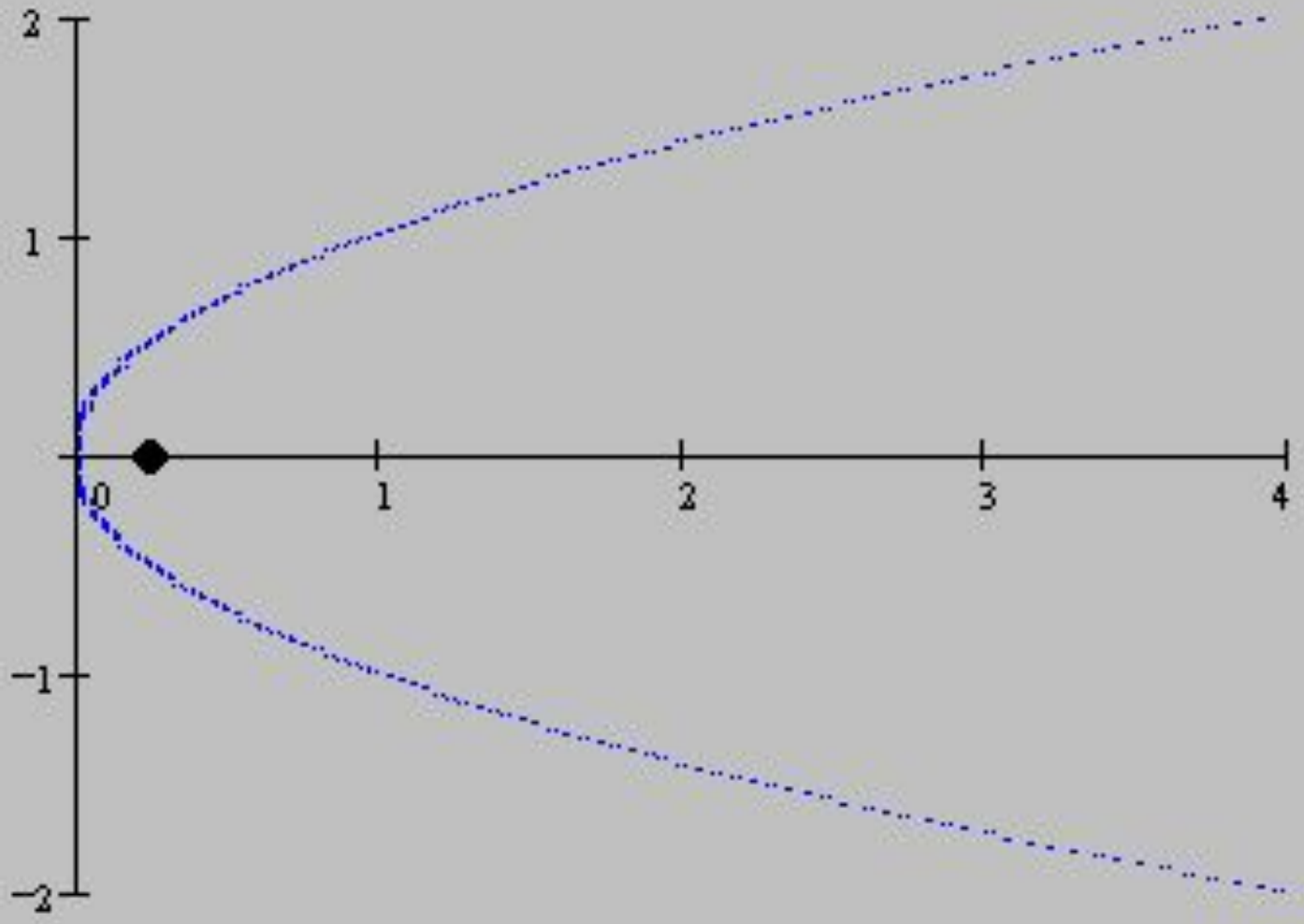
Distance to the right focus:

$$D_2\left(R_F, T_F\right)=5$$

Sum of the distances:

$$2\cdot a=10$$

# Фокальное свойство параболы

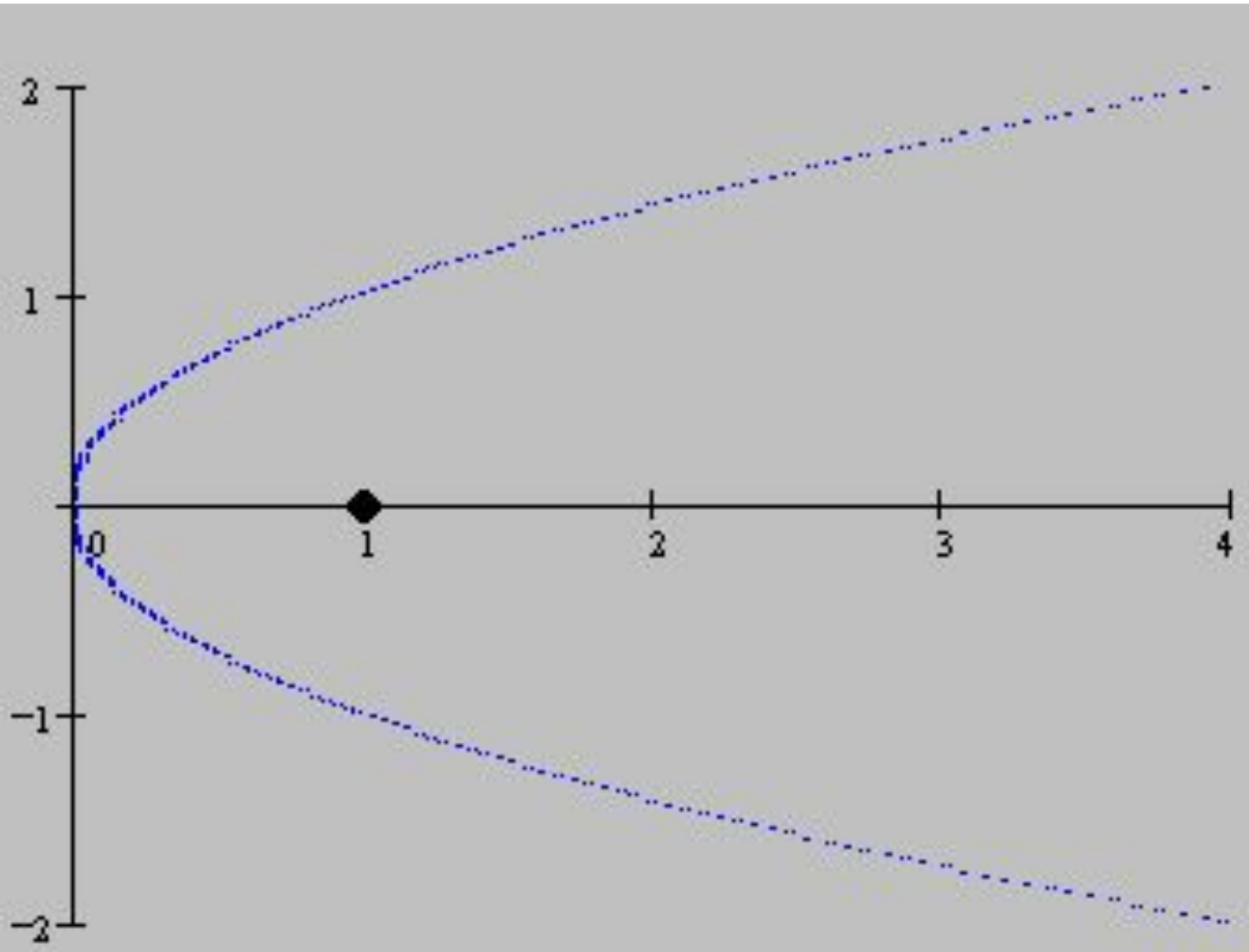



Parabola

$x = y^2$

Rays starting at

$PT = \begin{pmatrix} 0.25 \\ 0 \end{pmatrix}$



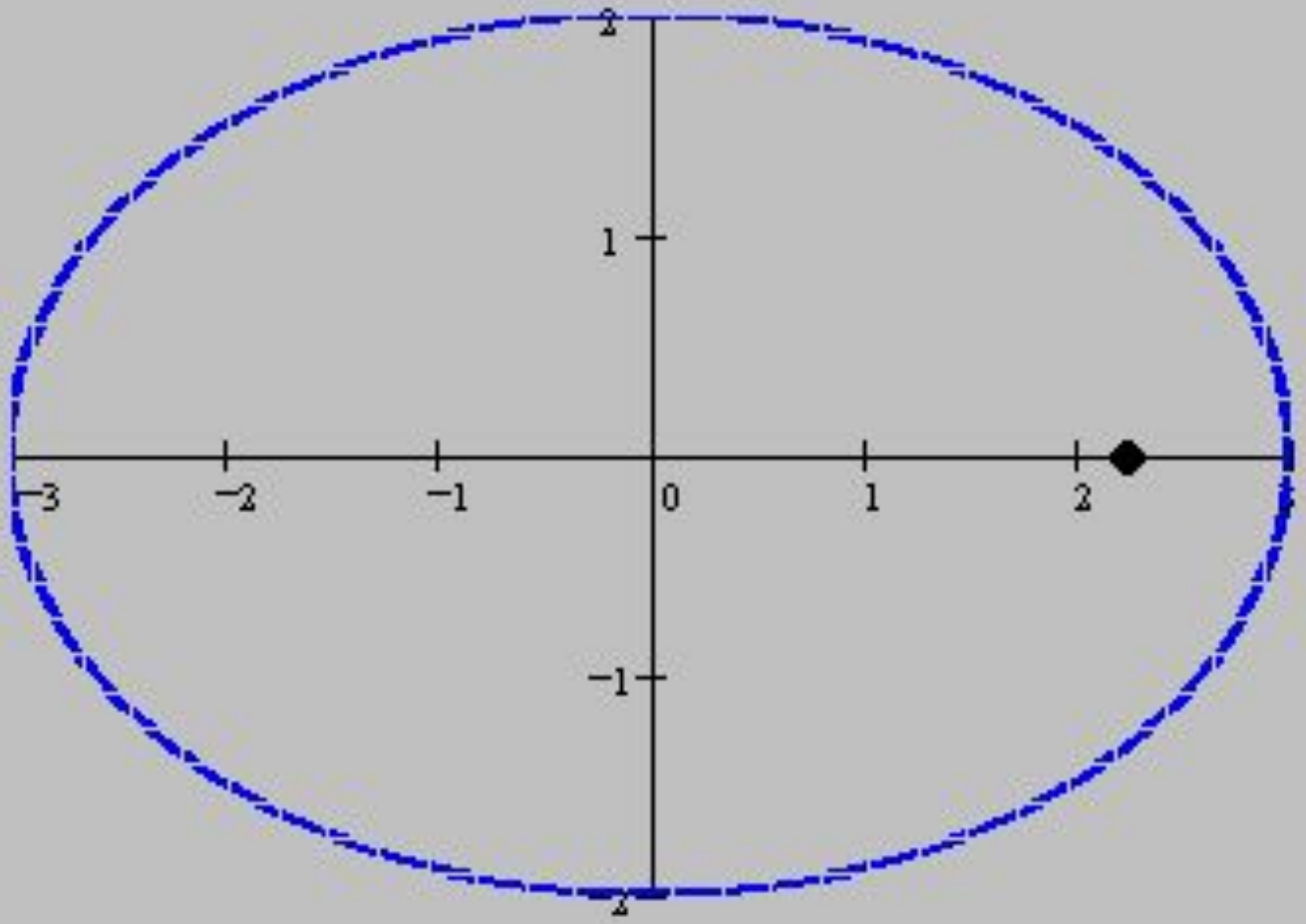

Parabola

$x = y^2$

Rays starting at

$PT = \begin{pmatrix} 1 \\ 0 \end{pmatrix}$

# Фокальное свойство эллипса

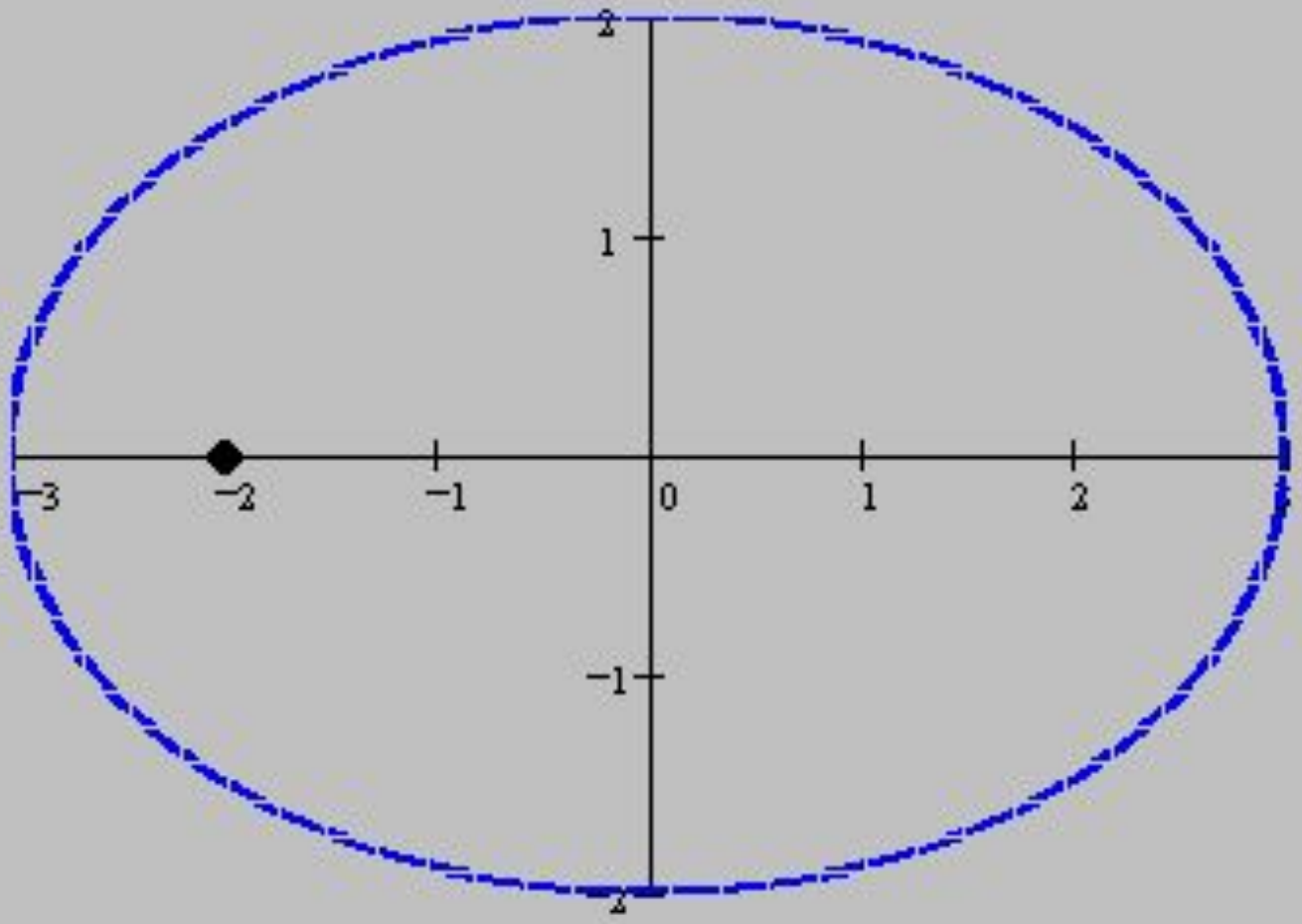



Ellipse

$$\frac{x^2}{9}+\frac{y^2}{4}=1$$

Rays starting at

$$PT := \begin{pmatrix} \sqrt{5} \\ 0 \end{pmatrix}$$

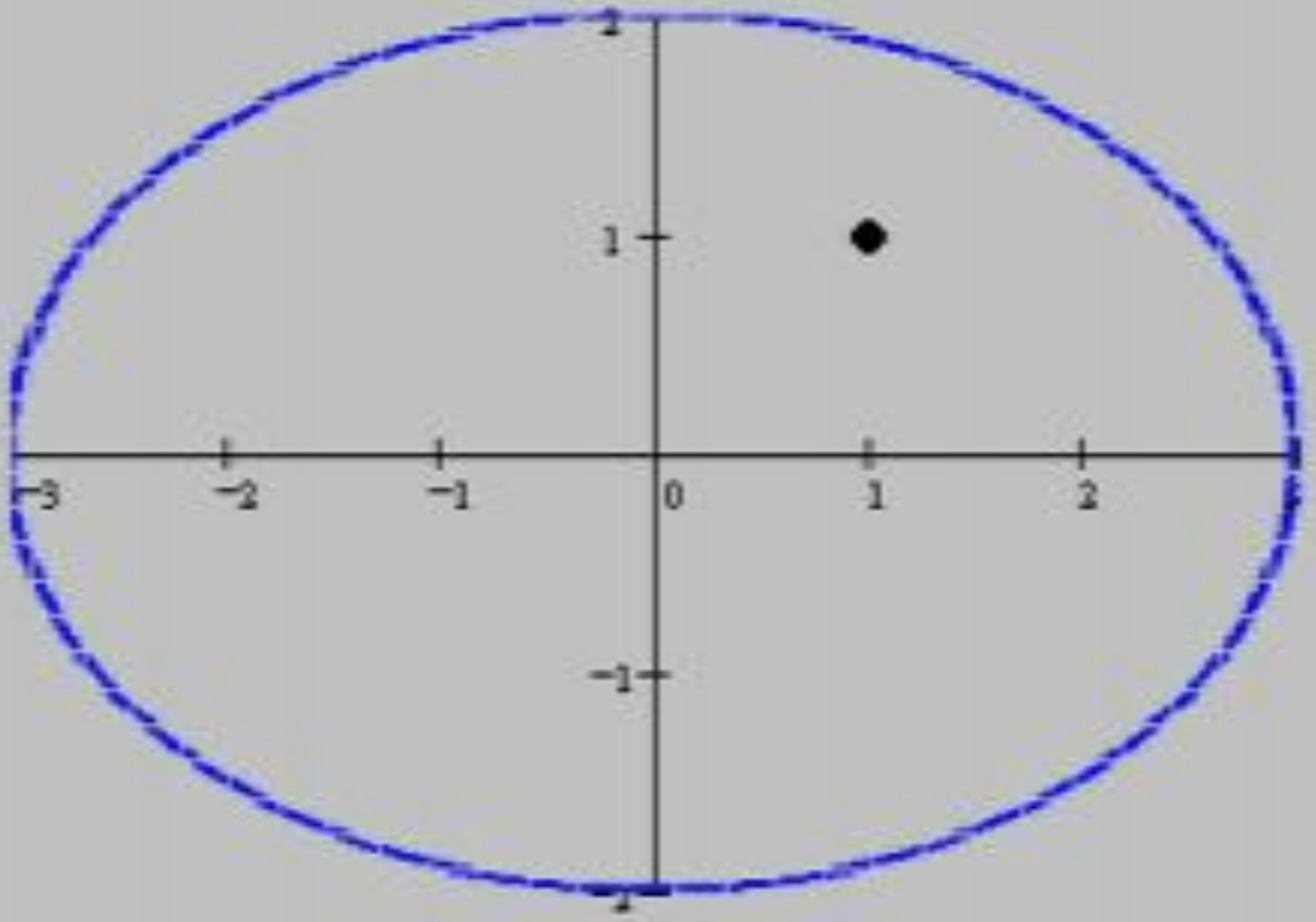



Ellipse

$$\frac{x^2}{9}+\frac{y^2}{4}=1$$

Rays starting at

$$PT := \begin{pmatrix} -2 \\ 0 \end{pmatrix}$$

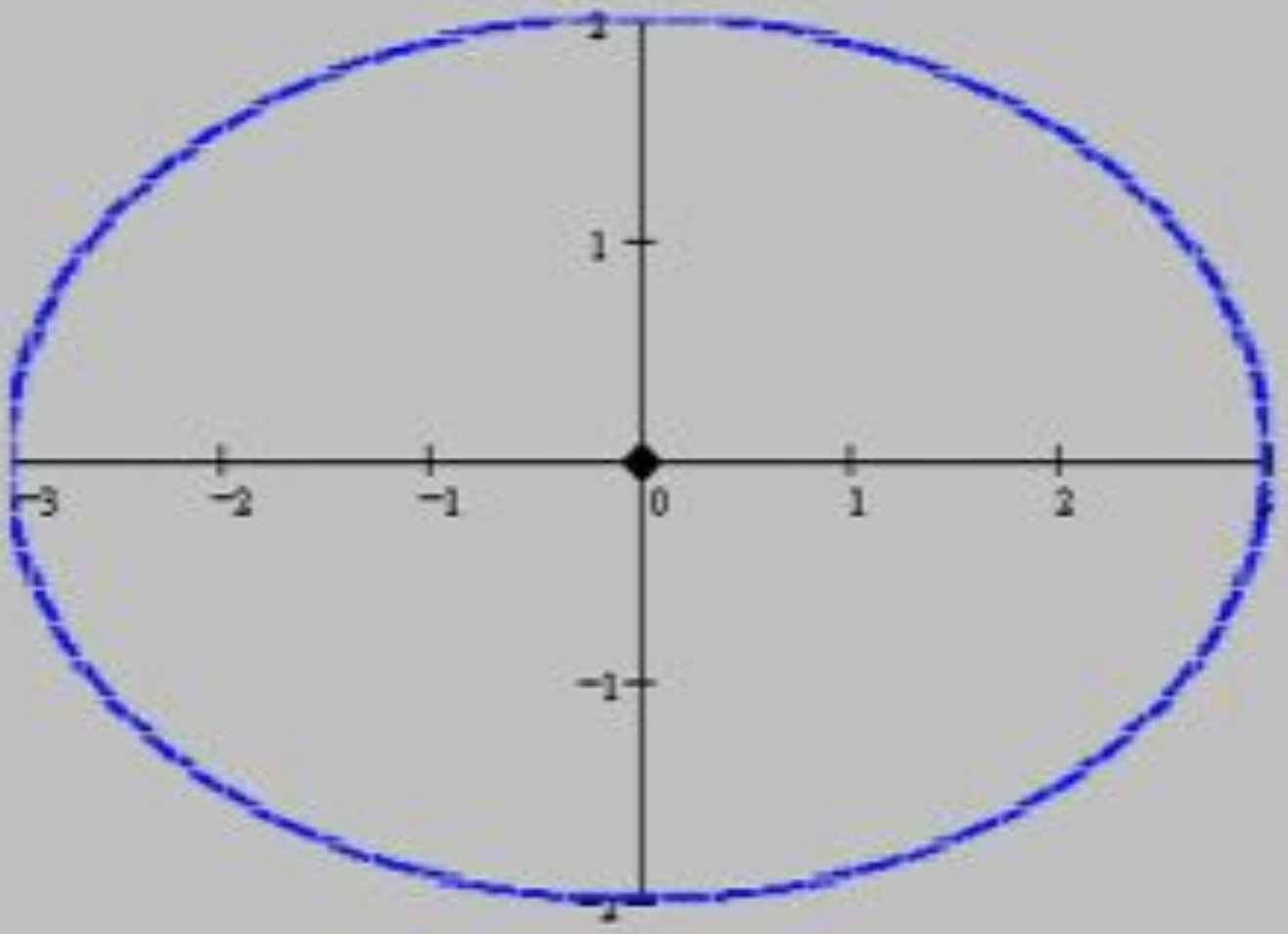



Ellipse

$$\frac{x^2}{9}+\frac{y^2}{4}=1$$

Rays starting at

$$PT := \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$

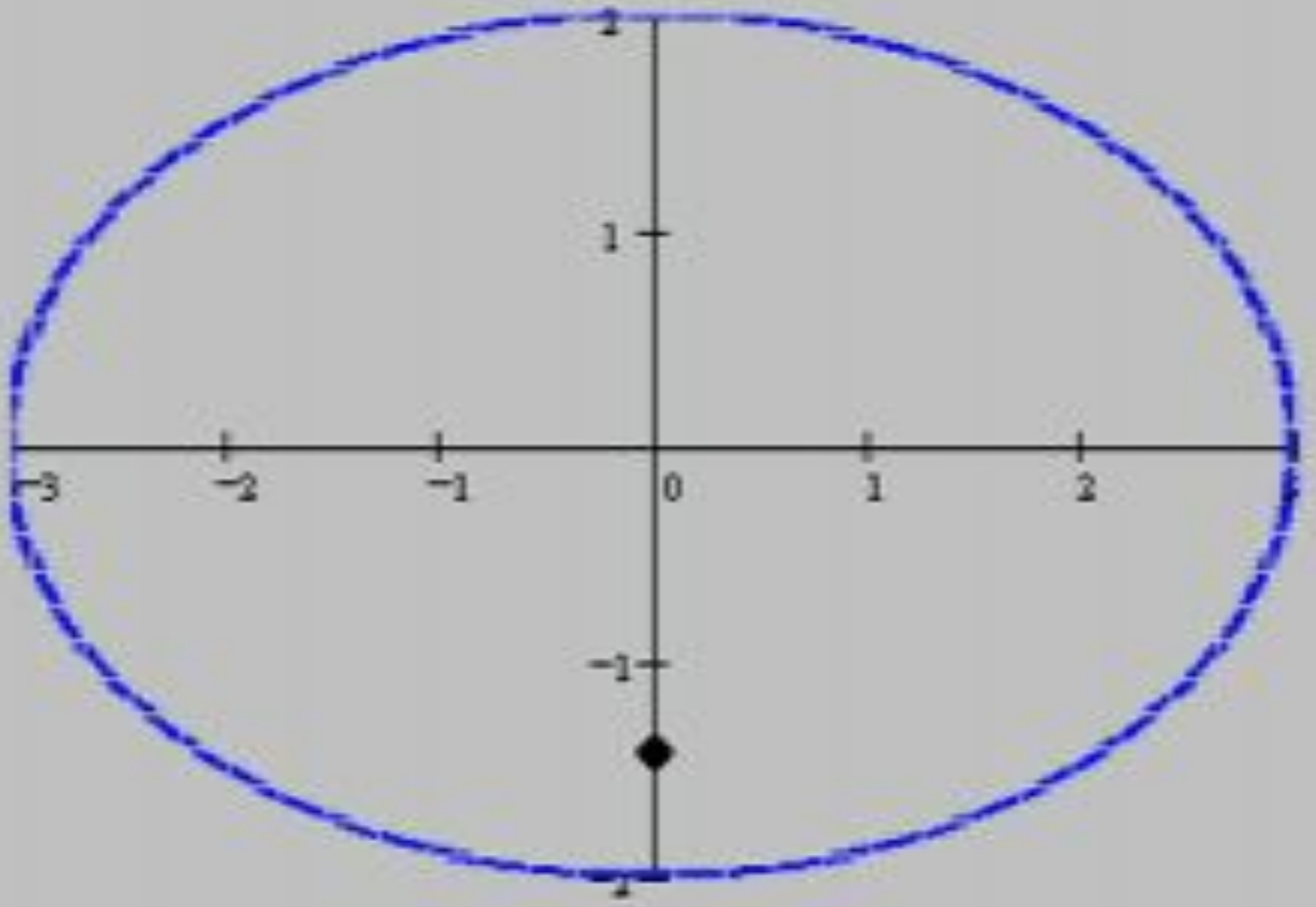



Ellipse

$$\frac{x^2}{9}+\frac{y^2}{4}=1$$

Rays starting at

$$PT := \begin{pmatrix} 0 \\ 0 \end{pmatrix}$$




Ellipse

$$\frac{x^2}{9}+\frac{y^2}{4}=1$$

Rays starting at

$$PT := \begin{pmatrix} 0 \\ -\sqrt{2} \end{pmatrix}$$

- $\in$