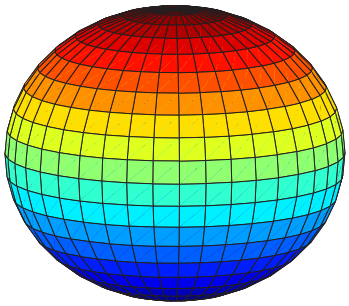
Některé plochy v $\mathbb{R}^3$

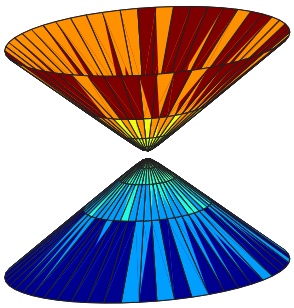
Kvadratická plocha – obecný elipsoid

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



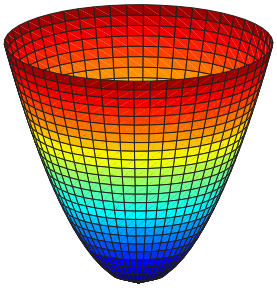
Kvadratická plocha – dvoudílný hyperboloid

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



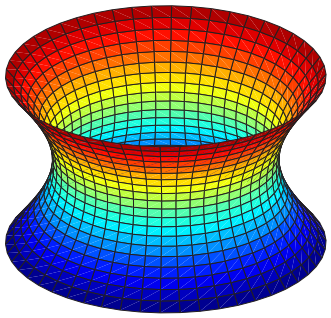
Kvadratická plocha – eliptický paraboloid

$$\frac{x^2}{a^2}+\frac{y^2}{b^2}-2\frac{z}{c}=0$$



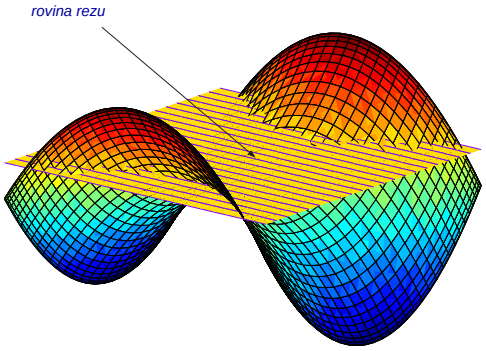
KVADRATICKÁ PLOCHA – JEDNODÍLNÝ HYPERBOLOID

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



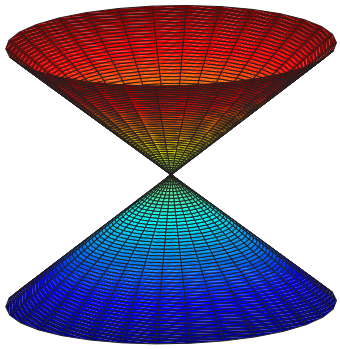
KVADRATICKÁ PLOCHA – HYPERBOLICKÝ PARABOLOID

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} - 2\frac{z}{c} = 0$$



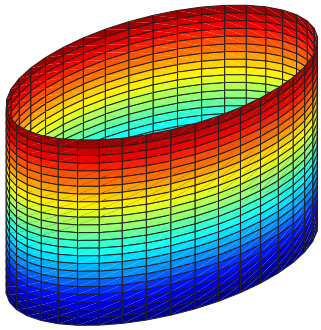
KVADRATICKÁ PLOCHA – KUŽELOVÁ PLOCHA

$$\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2} = 0$$



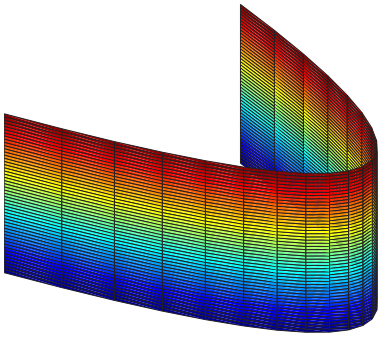
Kvadratická plocha – eliptický válec

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



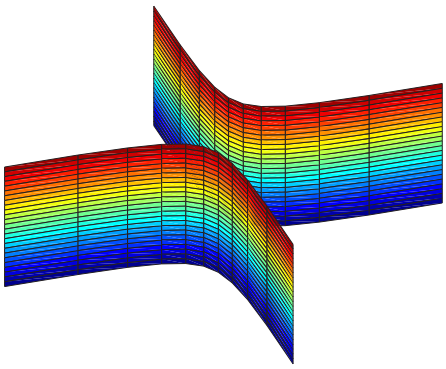
Kvadratická plocha – parabolický válec

$$\frac{x^2}{a^2} - 2\frac{y}{b} = 0$$



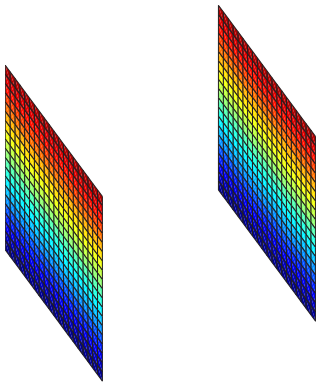
Kvadratická plocha – hyperbolický válec

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



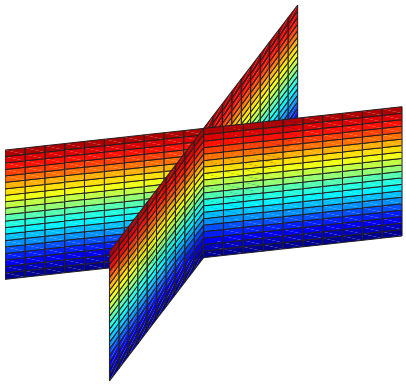
Kvadratická plocha – rovnoběžné roviny

$$\frac{x^2}{a^2} = 1$$



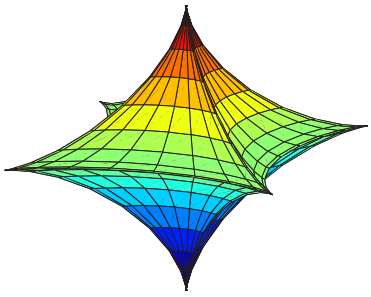
Kvadratická plocha – různoběžné roviny

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 0$$



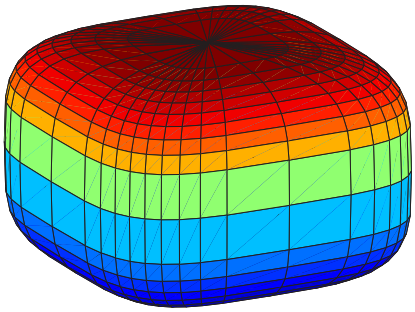
Obecná plocha – pseudoelipsoid

$$\left(\frac{|x|}{a}\right)^{2/3} + \left(\frac{|y|}{b}\right)^{2/3} + \left(\frac{|z|}{c}\right)^{2/3} = 1$$



Obecná plocha – pseudoelipsoid

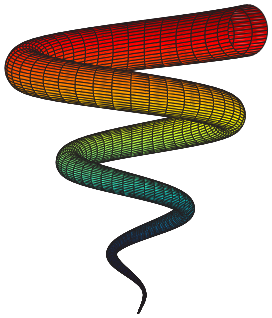
$$\frac{x^4}{a^4} + \frac{y^4}{b^4} + \frac{z^4}{c^4} = 1$$



Obecná plocha – džin

$$x = (a\sin(\varphi) + b)\vartheta\sin(\vartheta)$$
$$y = (a\sin(\varphi) + b)\vartheta\cos(\vartheta)$$
$$z = a\vartheta\cos(\varphi) + 2b\vartheta$$

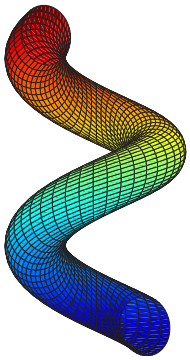
$$(\varphi, \vartheta) \in (0, 6\pi) \times (0, 2\pi)$$



Obecná plocha – šroubová plocha

$$x = -(\sin(\varphi) + a)\sin(\vartheta)$$
$$y = (\sin(\varphi) + a)\cos(\vartheta)$$
$$z = \cos(\varphi) + b\vartheta$$

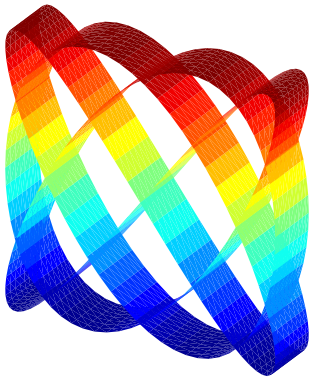
$$(\varphi, \vartheta) \in (0, 2\pi) \times (0, 3\pi)$$



Obecná plocha – stuha

$$
\begin{aligned}
x &= a\sin(\varphi)\cos(\varphi) \\
y &= a\sin(b\vartheta) \\
z &= a\sin(a\vartheta)
\end{aligned}
$$

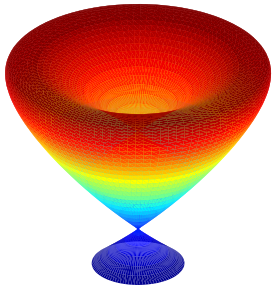
$$(\varphi, \vartheta) \in \left(0, \frac{\pi}{6}\right) \times (0, 2\pi)$$



Obecná plocha – sklenka

$$
\begin{aligned}
x &= a\sin(b+\vartheta)\cos(\varphi) \\
y &= a\sin(b+\vartheta)\sin(\varphi) \\
z &= a\sin(\vartheta)
\end{aligned}
$$

$$(\varphi, \vartheta) \in (0, 2\pi) \times \left(-\frac{\pi}{4}, \pi\right)$$



Obecná plocha – matematický cimrmanoid

$$
\begin{aligned}
x &= (a + b\cos(\rho))\sqrt{\cos(2\zeta)}\cos(\zeta) \\
y &= (a + b\cos(\rho))\sqrt{\cos(2\zeta)}\sin(\zeta) \\
z &= b\sin(\rho)
\end{aligned}
$$

$$(\rho, \zeta) \in (0, 2\pi) \times \left(-\frac{\pi}{4}, \frac{\pi}{4}\right)$$