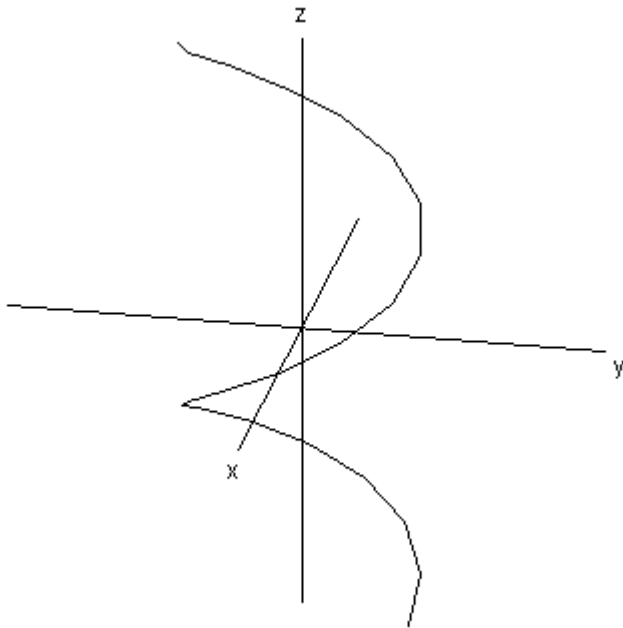


Grafici

Queste sono alcune tra le più tipiche curve e superfici create da funzioni $\mathbb{R}^n \rightarrow \mathbb{R}^m$.

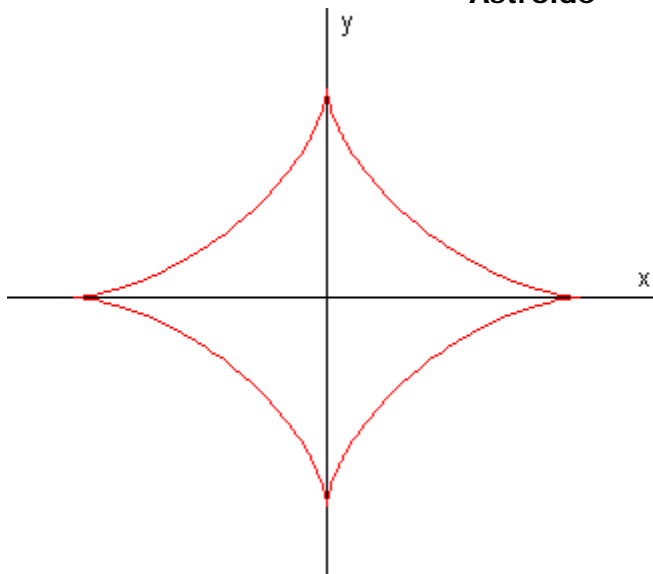
Sono state disegnate con Derive 6. Alcuni grafici hanno dei punti in cui sono spezzati o seghettati. In quei punti il grafico è in realtà continuo, ma per via della presenza di radici quadrate nell'equazione, Derive, che disegna punto per punto un grafico, ottiene valori così piccoli che non riesce a tracciare nulla.

Elica cilindrica



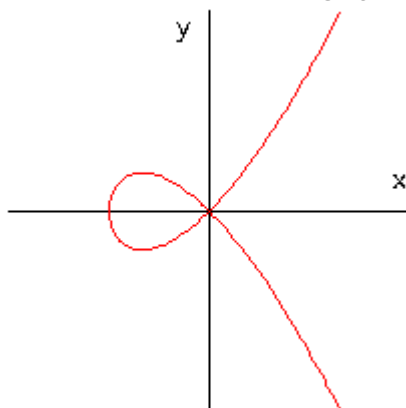
$$r(t) = \left\{ \begin{array}{l} x = R \cos t \\ y = R \sin t \\ z = pt \end{array} \right\} \text{ con } R, p \in \mathbb{R}$$

Astroide



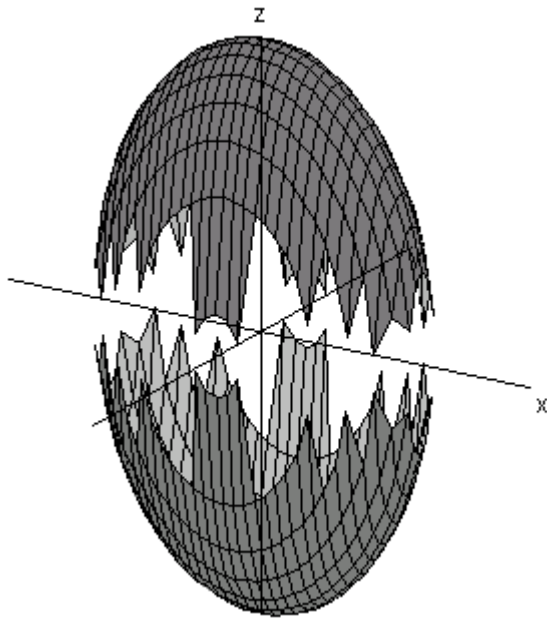
$$r(t) = (\cos^3 \theta, \sin^3 \theta)$$

Folium di Cartesio



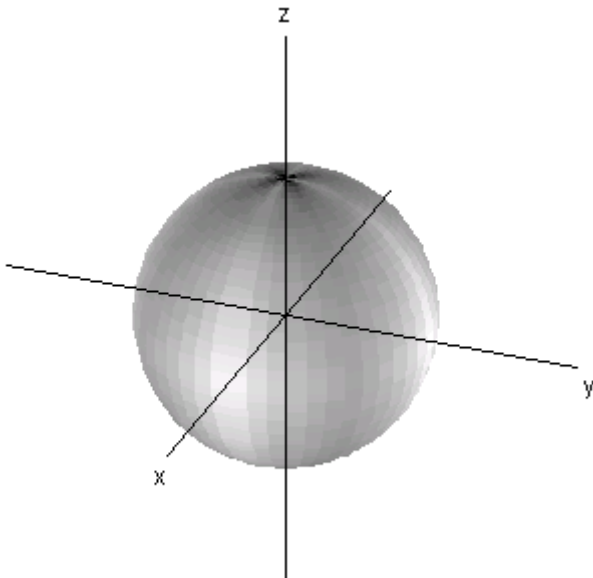
$$\left\{ \begin{array}{l} x = t \cdot (t-1) \\ y = t \cdot (t-1) \cdot (2t-1) \end{array} \right\}$$

Ellissoide



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

Sfera



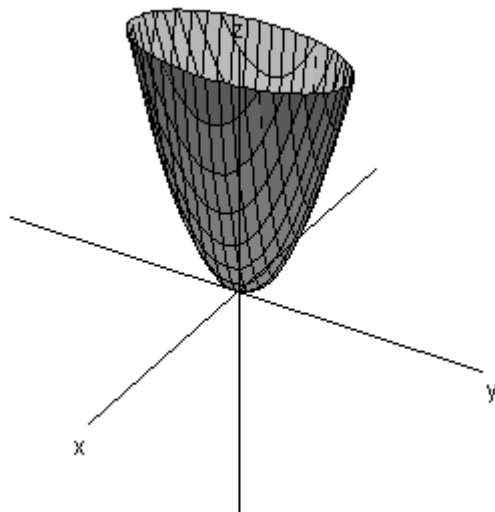
Forma cartesiana:

$$x^2 + y^2 + z^2 = R^2$$

Forma parametrica:

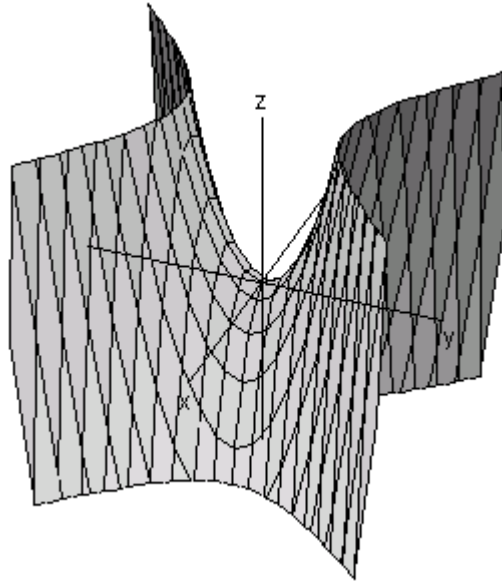
$$\left\{ \begin{array}{l} x = R \cdot \text{sen} \varphi \cdot \cos \theta \\ y = R \cdot \text{sen} \varphi \cdot \text{sen} \theta \\ z = R \cdot \cos \varphi \end{array} \right\} \text{ con } \left\{ \begin{array}{l} \rho \in [0, +\infty) \\ \theta \in [0, 2\pi) \end{array} \right\}$$

Paraboloide ellittico



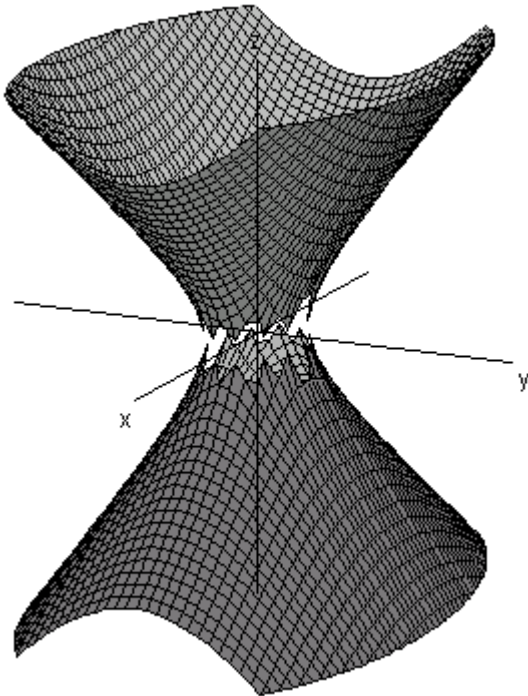
$$z = \frac{x^2}{a^2} + \frac{y^2}{b^2}$$

Paraboloide iperbolico



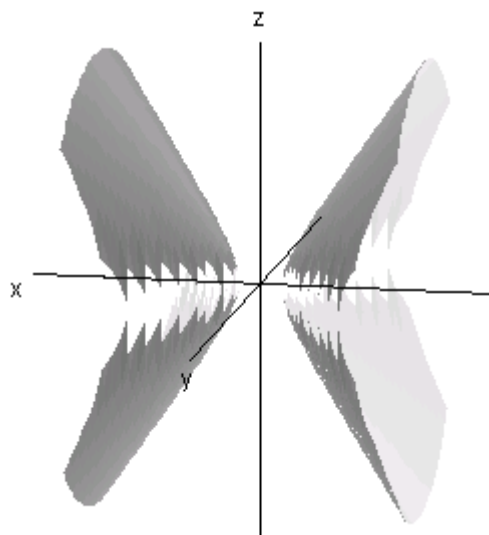
$$z = -\frac{x^2}{a^2} + \frac{y^2}{b^2}$$

Iperboloide a una falda



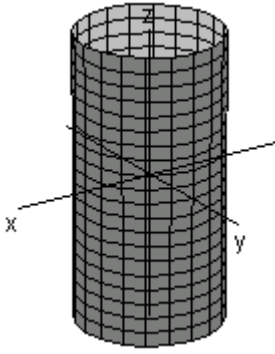
$$\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2} = 1$$

Iperboloide a 2 falde



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

Cilindro



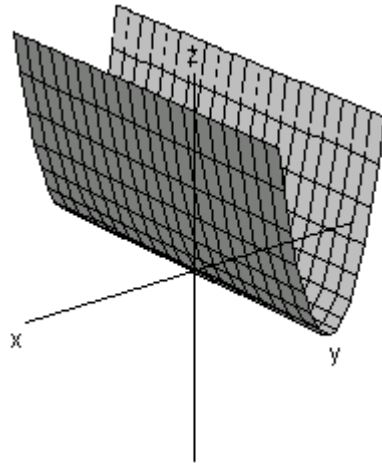
Forma cartesiana

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

Forma parametrica

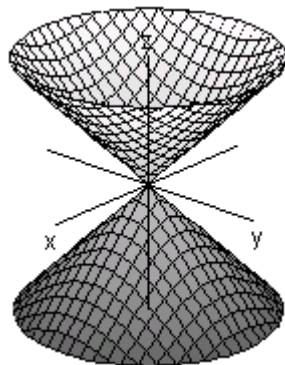
$$\left\{ \begin{array}{l} x = R \cdot \cos \theta \\ y = R \cdot \sin \theta \\ z = t \end{array} \right\} \text{ con } \left\{ \begin{array}{l} t \in \mathbb{R} \\ \theta \in [0, 2\pi) \end{array} \right\}$$

Cilindro parabolico



$$z = x^2$$

Cono



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

Tabella riassuntiva

Ellissoide	$\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$
Sfera	$x^2 + y^2 + z^2 = R^2$
Paraboloide ellittico	$z = \frac{x^2}{a^2} + \frac{y^2}{b^2}$
Paraboloide iperbolico	$z = -\frac{x^2}{a^2} + \frac{y^2}{b^2}$
Iperboloide a una falda	$\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2} = 1$
Iperboloide a 2 falde	$\frac{x^2}{a^2} - \frac{y^2}{b^2} - \frac{z^2}{c^2} = 1$
Cilindro	$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$
Paraboloide	$z = x^2$
Cono	$-\frac{x^2}{a^2} - \frac{y^2}{b^2} + \frac{z^2}{c^2} = 0$