



Superficies

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abril, 2016



Superficies

Def. Se llama superficie al conjunto de puntos cuyas coordenadas satisfacen una ecuación de la forma:

$$\mathbf{F(x, y, z) = 0}$$

Una superficie es resultado de...¿?



Superficies cuádricas

Son el lugar geométrico de los puntos P del espacio cartesiano R^3 cuyas coordenadas (x,y,z) satisfacen una ecuación de 2º grado en tres variables.

$$Ax^2+By^2+Cz^2+Dxy+Exz+Fyz+Gx+Hy+Iz+J=0$$

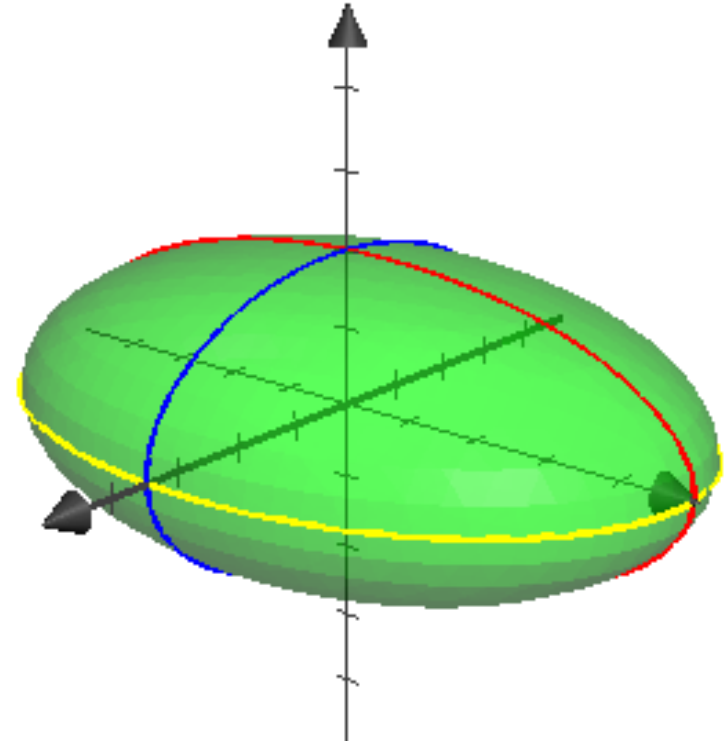
➤ Formas canónicas → Sencillas

➤ Formas no canónicas → No tan sencillas

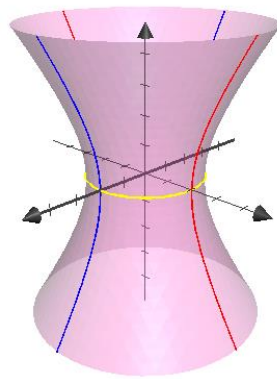
Cuádricas canónicas y sus fórmulas

Elipsoide

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

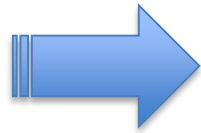


$$\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2} = 1$$

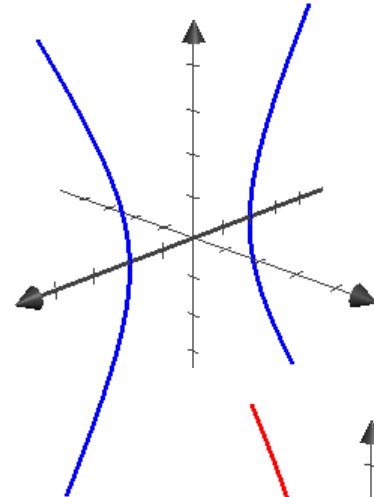


Traza

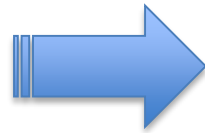
$$\frac{x^2}{a^2} - \frac{z^2}{c^2} = 1$$



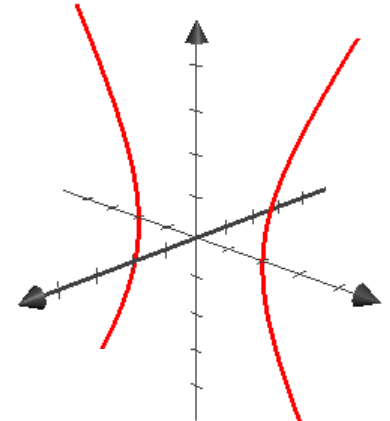
Hipérbola



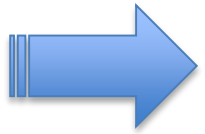
$$\frac{y^2}{b^2} - \frac{z^2}{c^2} = 1$$



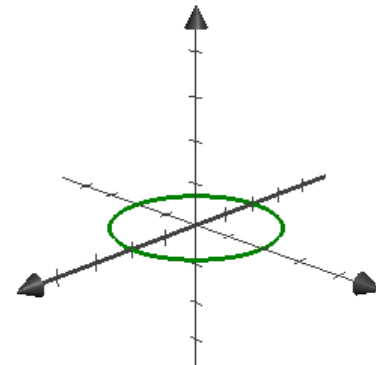
Hipérbola



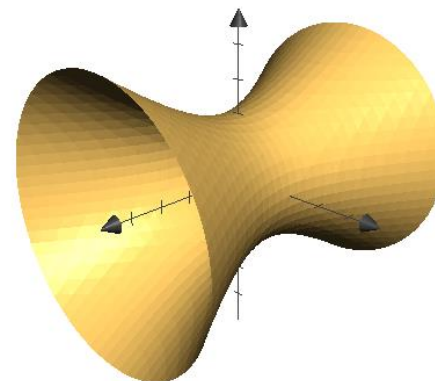
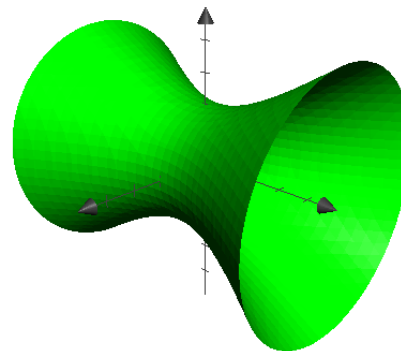
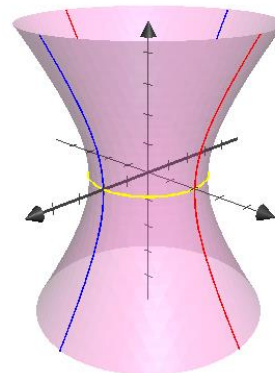
$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$$



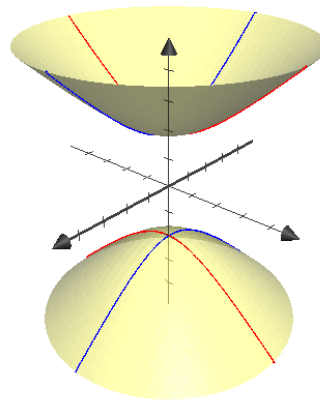
Elipse



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

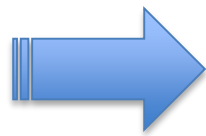


$$\frac{z^2}{c^2} - \frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$$

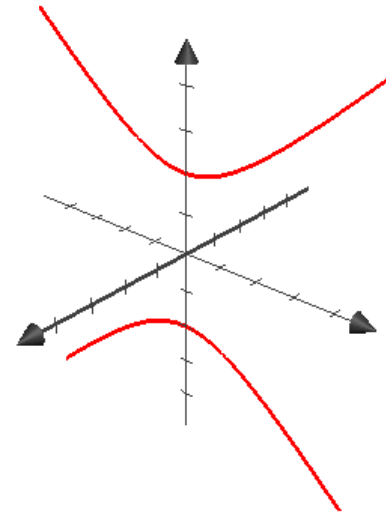


Traza

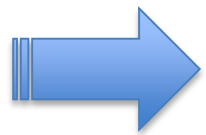
$$\frac{z^2}{c^2} - \frac{y^2}{b^2} = 1$$



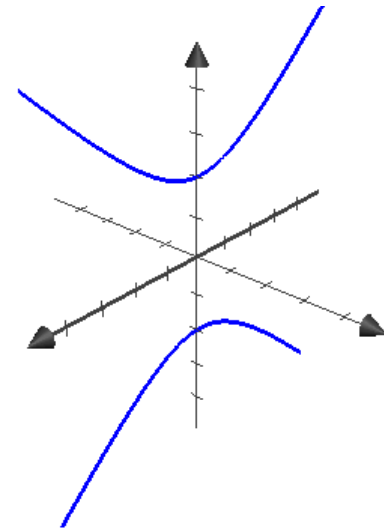
Hipérbola



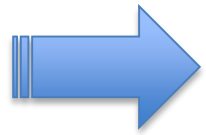
$$\frac{z^2}{c^2} - \frac{x^2}{a^2} = 1$$



Hipérbola



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

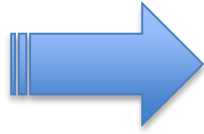


No hay traza

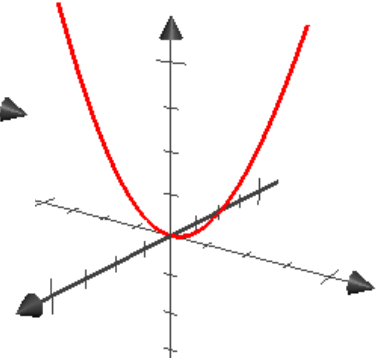
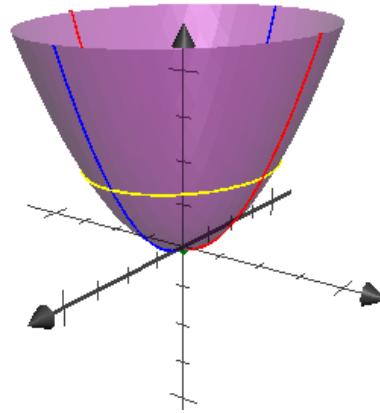
$$z = \frac{x^2}{a^2} + \frac{y^2}{b^2}$$

Traza

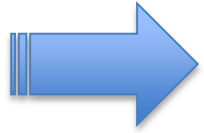
$$z = \frac{y^2}{b^2}$$



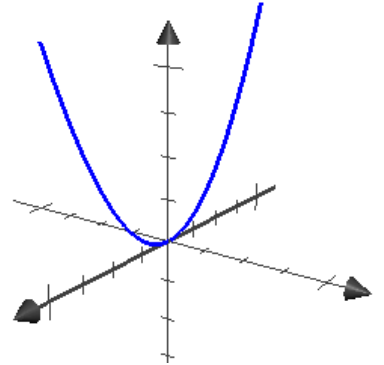
Parábola



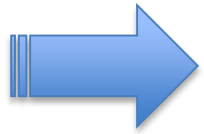
$$z = \frac{x^2}{a^2}$$



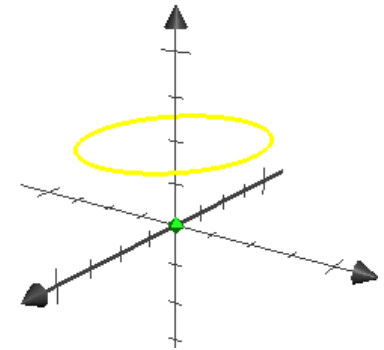
Parábola



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



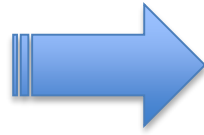
**Un Punto
/ Elipse**



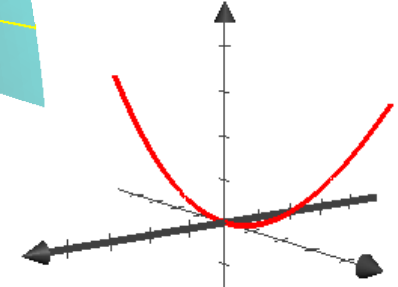
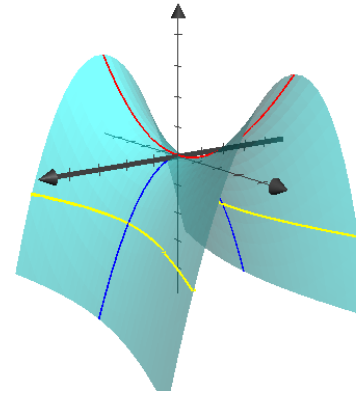
$$z = \frac{y^2}{b^2} - \frac{x^2}{a^2}$$

Traza

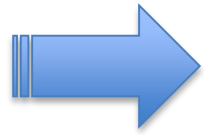
$$z = \frac{y^2}{b^2}$$



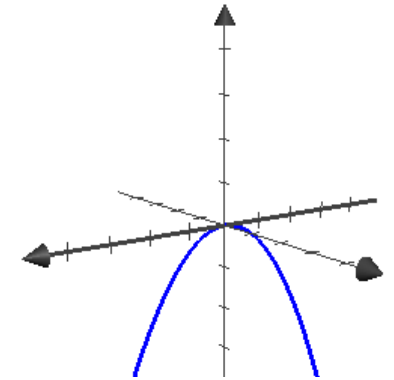
Parábola



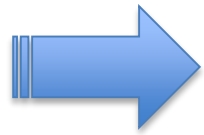
$$z = -\frac{x^2}{a^2}$$



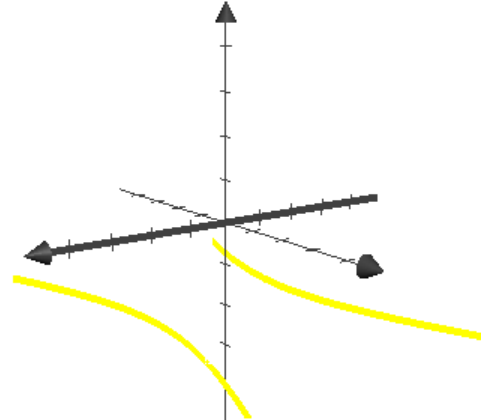
Parábola



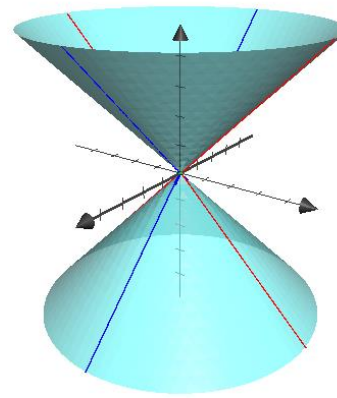
$$\frac{y^2}{b^2} - \frac{x^2}{a^2} = 0$$



Hipérbola

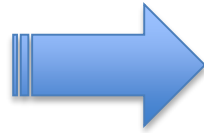


$$\frac{x^2}{a^2} + \frac{y^2}{b^2} - \frac{z^2}{c^2} = 0$$

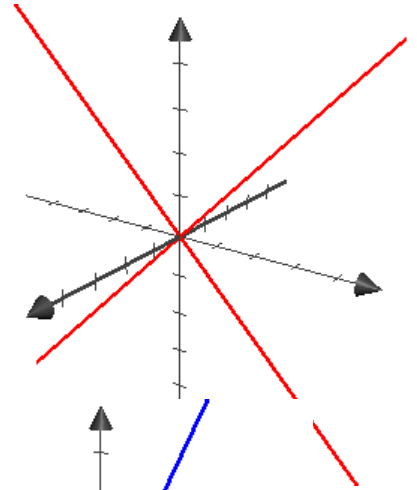


Traza

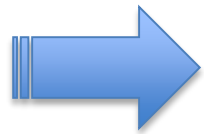
$$\frac{y^2}{b^2} - \frac{z^2}{c^2} = 0$$



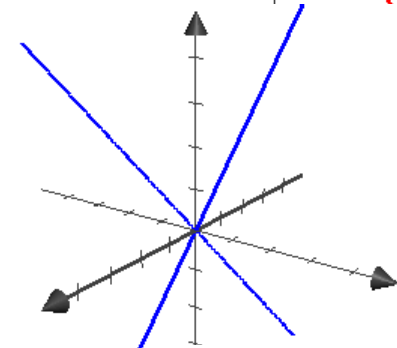
Rectas



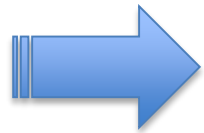
$$\frac{x^2}{a^2} - \frac{z^2}{c^2} = 0$$



Rectas



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



Un punto

