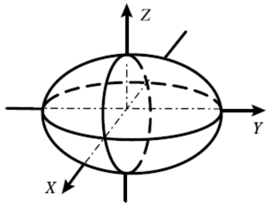
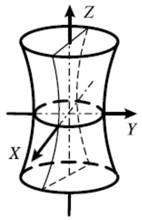
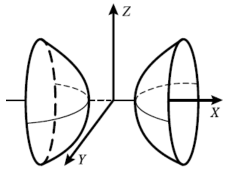
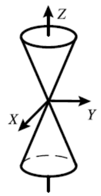
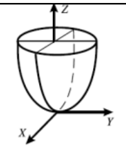
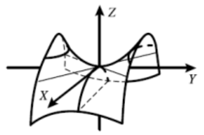
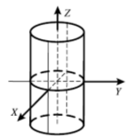
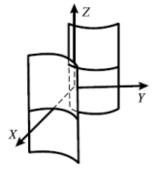
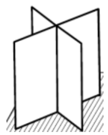
Tipo I. Todos los autovalores distintos de cero. $\lambda_1 x^2 + \lambda_2 y^2 + \lambda_3 z^2 = C \quad \text{con} \quad \text{C} = \dfrac{-\Delta}{\delta}$

	Forma canónica			
C ≠ 0 <=> Δ ≠ 0	$\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} + \dfrac{z^2}{c^2} = 1$	Elipsoide		El centro de simetría es la solución del sistema de ecuaciones lineales $\left\{\dfrac{\partial f}{\partial x} = 0,\ \dfrac{\partial f}{\partial y} = 0,\ \dfrac{\partial f}{\partial z} = 0\right\}$
	$\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} - \dfrac{z^2}{c^2} = 1$	Hiperboloide de una hoja		
	$\dfrac{x^2}{a^2} - \dfrac{y^2}{b^2} - \dfrac{z^2}{c^2} = 1$	Hiperboloide de dos hojas		
C = 0 <=> Δ=0	$\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = z^2$	Cono elíptico (o un punto)		

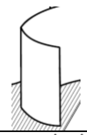
Tipo II. Dos autovalores no nulos y el otro $\lambda_3 = 0$

$$\lambda_1 x^2 + \lambda_2 y^2 + b_3 z = C \quad \text{con} \quad b_3^2 = \frac{-4\Delta}{\lambda_1 \lambda_2}$$

	Forma canónica			
$b_3 \neq 0$ <=> $\Delta \neq 0$	$\frac{x^2}{a^2} + \frac{y^2}{b^2} = z$	Paraboloide elíptico		El vértice es la solución de $\nabla f \times \overrightarrow{u_3} = \overrightarrow{0}$ $f(x, y, z) = 0$ con $\overrightarrow{u_3}$ autovector del autovalor cero
	$\frac{x^2}{a^2} - \frac{y^2}{b^2} = z$	Paraboloide hiperbólico (o silla de montar)		
$b_3 = 0$ <=> $\Delta = 0$	$\lambda_1 x^2 + \lambda_2 y^2 = C$	Cilindro elíptico, cilindro hiperbólico o dos planos secantes	  	$C = -f(\alpha, \beta, \gamma)$ con (α, β, γ) solución de $\left\{ \frac{\partial f}{\partial x} = 0, \frac{\partial f}{\partial y} = 0, \frac{\partial f}{\partial z} = 0 \right\}$

Tipo III. Un autovalor no nulo y los otros $\lambda_2 = 0$ y $\lambda_3 = 0$

$$\lambda_1 x^2 + b_2 y + b_3 z = C$$

	Forma canónica			
$b_2^2 + b_3^2 \neq 0$	$\lambda_1 x^2 = By$	Cilindro parabólico		
$b_2 = b_3 = 0$	$\lambda_1 x^2 = C$	Dos planos paralelos distintos o iguales según el valor de C.