2. $x^2-4xy-2yz+3y^2-8z+1$ $\to 0$

$$A=\begin{pmatrix}1&0&0&-4\\0&1&-2&0\\0&-2&3&-1\\-4&0&-1&0\end{pmatrix} \qquad |A|=15>0$$

q. iperbolica

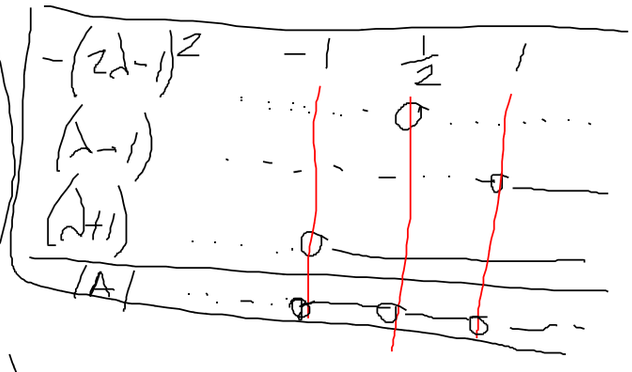
$$|M_{00}|=\begin{vmatrix}1&-2&0\\-2&3&-1\\0&-1&0\end{vmatrix}=\begin{vmatrix}1&0\\-2&-1\end{vmatrix}\neq 0$$

indef. $\Rightarrow$ iperboloide iperbolico

Es 16

$$(3\lambda-1)x^2+(1-\lambda)y^2+2\lambda xz+2z-4\lambda=0$$

$$A=\begin{pmatrix}-4\lambda&0&0&1\\0&(3\lambda-1)&0&\lambda\\0&0&(1-\lambda)&0\\1&\lambda&0&0\end{pmatrix}$$



$$|A|=-4\lambda^4+4\lambda^3+3\lambda^2-4\lambda+1=$$
$$=-(\lambda-1)(\lambda+1)(2\lambda-1)^2$$

deg $\Leftarrow$ $\lambda=1 \ \vee \lambda=-1 \ \vee \lambda=\frac{1}{2}$

$$M_{00}=\begin{pmatrix}(3\lambda-1)&0&\lambda\\0&(1-\lambda)&0\\\lambda&0&0\end{pmatrix}$$

$$A_{00}=(1-\lambda)\begin{vmatrix}(3\lambda-1)&\lambda\\\lambda&0\end{vmatrix}=$$

$$=(1-\lambda)(-\lambda^2)$$

λ	$\lvert A \rvert$	M_0^σ	Quadriche
$\lambda < -1$	$-$	ind	iperboloidi ell.
$-1 = \lambda$	0	ind	cono
$-1 < \lambda < 0$	$+$	ind	iperboloidi ip.
$\lambda = 0$	$+$	0	paraboloide ip.
$0 < \lambda < \frac{1}{2}$	$+$	ind	iperboloidi ip.
$\lambda = \frac{1}{2}$	0	ind	cono
$\frac{1}{2} < \lambda < 1$	$+$	ind	iperboloidi ip.
$\lambda = 1$	0	0	cono
$\lambda > 1$	$-$	ind	iperboloidi ell.