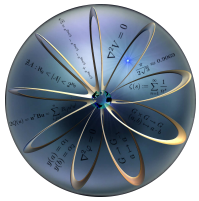

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Hilbert symbol

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Let K be any local field. For any two nonzero elements $a, b \in K^\times$, we define:

$$(a,b) := \begin{cases} +1 & \text{if } z^2 = ax^2 + by^2 \text{ has a nonzero solution } (x,y,z) \neq (0,0,0) \text{ in } K^3, \\ -1 & \text{otherwise.} \end{cases}$$

The number (a,b) is called the *Hilbert symbol* of a and b in K.