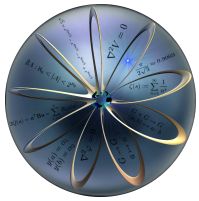

planetmath.org

Math for the people, by the people.

equitable matrices of order 2

Canonical name	EquitableMatricesOfOrder2
Date of creation	2013-03-22 14:58:30
Last modified on	2013-03-22 14:58:30
Owner	matte (1858)
Last modified by	matte (1858)
Numerical id	4
Author	matte (1858)
Entry type	Example
Classification	msc 15-00

The most general 2×2 equitable matrix is of the form

$$M = \begin{pmatrix} 1 & \lambda \\ 1/\lambda & 1 \end{pmatrix}$$

for some $\lambda > 0$.

Let us consider the matrix

$$M = \begin{pmatrix} m_{11} & m_{12} \\ m_{21} & m_{22} \end{pmatrix}.$$

A necessary and sufficient condition for M to be an equitable matrix is that $m_{11}, m_{12}, m_{21}, m_{22} > 0$ and

$$\begin{aligned} m_{11} &= m_{11}m_{11}, \\ m_{11} &= m_{12}m_{21}, \\ m_{12} &= m_{11}m_{12}, \\ m_{12} &= m_{12}m_{22}, \\ m_{21} &= m_{21}m_{11}, \\ m_{21} &= m_{22}m_{21}, \\ m_{22} &= m_{21}m_{12}, \\ m_{22} &= m_{22}m_{22}. \end{aligned}$$

It follows that $m_{11} = m_{22} = 1$, and $m_{12} = 1/m_{21}$.