Step-1

Given that the statement is

The inverse of a 2×2 matrix seems to have determinant = 1.

$$\det A^{-1} = \det \frac{1}{ad-bc}\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$$ â€¦â€¦ (1)

$$= \frac{ad-bc}{ad-bc}$$ â€¦â€¦ (2)

$$=1$$ â€¦â€¦ (3)

Step-2

But this is a wrong calculation since in step (2), the formula used is $\det(tA)\ \det(tA) = t.\det(A)$ which is false.

We need to find correct $\det A^{-1}$

Now

$$\det A^{-1} = \det \frac{1}{ad-bc}\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$$

$$= \left(\frac{1}{ad-bc}\right)^2 (ad-bc)$$ (Here $n=2$, since the size of the matrix is 2 by 2)

$$= \frac{1}{ad-bc} \left(\text{since} \begin{vmatrix} \mathrm{a} & \mathrm{b} \\ \mathrm{c} & \mathrm{d} \end{vmatrix} = ad-bc \right)$$

Hence the correct calculation is $\boxed{\det A^{-1} = \frac{1}{ad-bc}}$.