Inversion of 2x2 Matricies

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September 2024

Notes on the inversion of 2x2 matrices, which can be applied to an arbitrary number of $n \cdot n$ matrices.

1 The inversion of a matrix

Just like every number has a reciprocal such as 8^{-1}, a matrix n also has a reciprocal: n^{-1}. When a matrix is multiplied by it's reciprocal ($n \cdot n^{-1}$) the result is I, also known as the identity matrix. The identity matrix is the matrix equivelance of the number 1 obtained from the reciprocal of a real number, in other words, the identity matrix is just 1, exactly the same way that the reciprocal of $\frac{1}{8} \cdot 8 = 1$. This information is not terribly important, but is nontheless useful to know.

A good example of an identity matrix is a 3×3 matrix, I:

$$i = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$

You can see here that it has got 1 going down diagonally and 0 in every other row and column. An identity matrix, as mentioned in the title can be $2 \cdot 2$, $3 \cdot 3$, $4 \cdot 4$... The inverse of a matrix a is a^{-1} only when $a \cdot a^{-1} = a^{-1} \cdot a = i$

2 2x2 matricies