Other Facts.

1. Let A be a $n \times n$ matrix. Then, $AA^{-1} = I_{n \times n}$.

2. If you divide a matrix, you are multiplying by its inverse.
   E.g. $AB = C$
   $B = A^{-1}C$

3. Multiplying a matrix by the identity matrix gets you the same matrix.
   E.g. Let A be a $n \times n$ matrix.
   $AI_{n \times n} = A$

4. Let A be a $n \times n$ matrix.
   Let c be a constant.
   $\det(cA) = c^n \cdot \det(A)$
   E.g. Let A be a 3×3 matrix.
   Let $\det(A) = 2$
   $\det(3A) = 3^3 \cdot \det(A)$
   $= 27 \cdot 2$
   $= 54$

5. $$\det(A^{-1}) = \frac{\det(I)}{\det(A)}$$
   $$= \frac{1}{\det(A)}$$

E.g. If $\det(A) = 2$, find $\det(A^{-1})$

$\det(A \cdot A^{-1}) = \det(I) = 1$

$1 = \det(A) \cdot \det(A^{-1})$

$$\frac{1}{\det(A)} = \det(A^{-1})$$

$$\frac{1}{2} = \det(A^{-1})$$

6. A singular matrix is a matrix that is not invertible. If A is a singular matrix, then $\det(A) = 0$.

7. To find the inverse image of a linear transformation, find the inverse of the standard matrix rep of that linear transformation.