Additional Observations

- For 2×2 matrices:

$$\begin{bmatrix} a & b \\ c & d \end{bmatrix}^{-1} = \frac{1}{ad - bc} \begin{bmatrix} d & -b \\ -c & a \end{bmatrix} \quad \text{(just verify that } AA^{-1} = I\text{)}$$

  as long as $ad - bc \neq 0$.

- Diagonal matrices:

$$\begin{bmatrix} d_1 & 0 & 0 \\ 0 & d_2 & 0 \\ 0 & 0 & d_3 \end{bmatrix}^{-1} = \begin{bmatrix} \frac{1}{d_1} & 0 & 0 \\ 0 & \frac{1}{d_2} & 0 \\ 0 & 0 & \frac{1}{d_3} \end{bmatrix} \quad \text{(just verify that } AA^{-1} = I\text{)}$$

  as long as $d_1 d_2 d_3 \neq 0$.

- $(AB)^{-1} = B^{-1}A^{-1}$ (note reverse order)
  Proof: $(AB)(B^{-1}A^{-1}) = A(BB^{-1})A^{-1} = AIA^{-1} = AA^{-1} = I$, so $B^{-1}A^{-1}$ is the inverse of AB