

Assignment 1

Ryan T. Godwin

Worth 1%. Pass / fail. Due Sept. 15th. Don't use any AI. Do everything by yourself. Refer to <https://rtgodwin.com/7010/matrices.pdf>

1. Let

$$A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}$$

Find A' .

2. Find $A'A$.
3. Find $(A'A)^{-1}$.
4. Find $(A'A)^{-1}A'A$.
5. Let

$$\mathbf{y} = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}$$

Find $\mathbf{y}'\mathbf{y}$.

6. Find $\mathbf{y}\mathbf{y}'$.
7. Let

$$B = \begin{bmatrix} 6 & 0 & 0 \\ 0 & 6 & 0 \\ 0 & 0 & 6 \end{bmatrix}$$

and let $cI = B$, where c is a scalar constant and I is the identity matrix. Solve for c .

8. Let $C = \begin{bmatrix} 1 & 3 \\ 2 & 4 \end{bmatrix}$ and $D = \begin{bmatrix} 3 & 2 \\ 1 & 1 \end{bmatrix}$. Show that $(CD)' = D'C'$.