Claim: Let A, B, C be $n \times n$ Matrices. Then $A + B = B + A$.

Proof: In order to show that these two matrix expressions are equal, we need to show that $(A + B)_{ij} = (B + A)_{ij}$ for any indices $1 \leq i, j \leq n$.

$$
\begin{aligned}
& (A + B)_{ij} \\
= \; & A_{ij} + B_{ij} && \text{Definition of Matrix Addition} \\
= \; & B_{ij} + A_{ij} && \text{Commutativity of Addition for Real Numbers} \\
= \; & (B + A)_{ij} && \text{Definition of Matrix Addition (Reverse)}
\end{aligned}
$$

Thus showing that $(A + B)_{ij} = (B + A)_{ij}$ as desired.