Instructions

1. The statements in Italics are for introducing results and notations that may be used again in this course. You are only required to read and think about them.

2. To receive full credit you must explain how you got your answer.

3. While I encourage collaboration, you must write solutions IN YOUR OWN WORDS. DO NOT SHARE COMPLETE SOLUTIONS before they are due. YOU WILL RECEIVE NO CREDIT if you are found to have copied from whatever source or let others copy your solutions.

4. Workshops must be handwritten (electronic handwriting is allowed) for authentication purposes and submitted on Canvas. Please do NOT include any personal information such as your name and netID in your file. Late homework will NOT be accepted. It is your responsibility to MAKE SURE THAT YOUR SUBMISSIONS ARE SUCCESSFUL AND YOUR FILES ARE LEGIBLE AND COMPLETE. It is also your responsibility that whoever reads your work will understand and enjoy it. Up to 1 point out of 10 may be taken off if your solutions are hard to read or poorly presented.

Workshop 4

1. In the video "How to Multiply Matrices" we saw that, for general matrices A and B, when the product AB is defined, the product BA may not be defined. Give examples to show:

a. Even if both AB and BA are defined, the two products may not have the same size.

b. Even if both AB and BA are defined and they have the same size, the two products may not be equal.

2. Find two 2×2 **nonzero matrices** (i.e. matrices whose entries are not all 0) that multiply to the **zero matrix** (i.e. a matrix whose entries are all 0).

3. Show that if A is an invertible matrix, then its inverse is unique. *We denote the inverse of A by A^{-1}.*

4. Suppose A, B are $n \times n$ invertible matrices. Is their product AB invertible? If so, what's its inverse? *Later in the course we will see that if A, B are $n \times n$ matrices such that their product AB is invertible, then A and B are invertible.*