Homework 2 - Due September 24

Homework instructions: Complete the assigned problems on your own paper. Once you are finished, scan or photograph your work and upload it to Gradescope. When prompted, tell Gradescope where to find each problem.
You are allowed (and in fact encouraged) to work with other students on homework assignments. If you do that, please indicate on each problem who you worked with. If you use sources other than your notes, the textbook, and any resources on Canvas for your homework, you must indicate the source on each problem. You are not permitted to view, request, or look for solutions to any of the homework problems from solutions manuals, homework help websites, online forums, other students, or any other sources.

Textbook Problems:

- §3.4: 3, 5, 8, 11
- §3.5: 3, 10, 16
- §3.6: 4, 9, 21

Additional Problems:

1. Give an example of matrices A and B where $AB = BA$.
2. Give an example of matrices C and D where $CD \neq DC$.
3. Let A, B, and C be invertible $n \times n$ matrices. Is the product ABC invertible? If it is invertible, what is $(ABC)^{-1}$?
4. Let $T = \begin{bmatrix} t_1 & 0 & 0 \\ 0 & t_2 & 0 \\ 0 & 0 & t_3 \end{bmatrix}$ be a diagonal matrix. What is $\det T$?

   Optional: Consider an $n \times n$ diagonal matrix T. That is, T has entries $t_1, t_2, \ldots, t_n$ on the main diagonal and 0's everywhere else. What is $\det T$? The required part of this problem asks you to answer this question for the case where $n = 3$.