Math 324 Homework 6
YOUR NAME
Due 3/11/20

Submit well-organize solutions to the following exercises You may work together however you MUST NOT copy one another. Your final submission MUST be written in your own words. It is unacceptable and unethical to look up the answers online.

1. List the names of all people (students, TA's, Professors) with whom you spoke about this assignment. There are no restrictions for how many people you spoke to and no negative repercussions to just chatting. **You're encouraged to fill this space up.

2. Section 3.1 Exercise 26

3. Section 3.1 Exercise 52

4. Section 3.2 Exercise 34

5. Let $A = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$.

   (a) Experimentally (using a computer/calculator) determine a formula for A^n.

   Claim: $A^n = \begin{bmatrix} ? & ? \\ ? & ? \end{bmatrix}$

   (b) Prove the formula using mathematical induction.

   Proof. Base Case: But of course.

   Inductive Step: It's elementary dear Watson.

   □

6. **Appendix Exercise 10** Let $A_1, A_2, \ldots, A_n$ be matrices with sizes for which the product $A_1 A_2 \cdots A_n$ is defined. Use mathematical induction to prove that

$$(A_1 A_2 \cdots A_n)^T = A_n^T \cdots A_2^T A_1^T.$$

   Proof. Type proof here. □

7. **Section 3.2 Exercise 48** Prove Property 3 of Theorem 3.3: If B is obtained from A by multiplying a row of A by a nonzero constant c, then $\det(B) = c\det(A)$.

   Proof. That one thing and that other thing. □