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:

- §3.7: 3

- §4.1: 1, 19, 23, 27

- §4.2: 2, 4, 17, 21

Additional Problems:

1. My fictional company Linear Algebra Inc had a stock price of $10 on day 1, $15 on day 2, and $10 on day 3. Interpolate this data with a quadratic polynomial $f(t) = a + bt + ct^2$, where t is the day and $f(t)$ is the price on day t.

   Is it a good idea to use $f(t)$ to predict the stock price of Linear Algebra Inc on day 4?

2. Geometrically, what do subspaces of $\mathbb{R}^2$ look like?

3. Let A be an $n \times n$ matrix and consider the linear system $A\vec{x} = \vec{b}$. If I know that the solution set to this linear system is a subspace of $\mathbb{R}^n$, what can you say about $\vec{b}$?