HOMEWORK 1
DUE WEDNESDAY, 23 JANUARY 2008

MATH 215 - LINEAR ALGEBRA - TOM LAGATTA

- Read pages 1-25 in the textbook (Sections 1.1 and 1.2).
- Fill out the questionnaire on the next page.
- **Section 1.1:** 1, 3, 5, 7, 9, 11, 13, 17. Unless otherwise stated, I expect you to do all book problems by hand, though I encourage you to check your work using MATLAB. Solutions to odd-numbered problems are in the back of the book, which means I am grading you based on your work, not just the answer!
- Prove Theorem 1.1, parts (e) and (f). I'd like you to do this for vectors in $\mathbb{R}^n$, but if you want you may do it just for vectors in the plane. Follow the proofs of (a) and (b) given on the same page. Don't just jump right into calculations, make sure to start your proof with

  $$\text{Let } \mathbf{u} = [u_1, \ldots, u_n] \text{ and } \mathbf{v} = [v_1, \ldots, v_n]. \text{ We calculate, } \ldots$$

  You may denote your vectors by $\mathbf{u}$, $\vec{u}$, or even by plain old u.
- **MATLAB:** This is not meant to be a difficult problem. I just want you to get your hands dirty with MATLAB. Play around while you're at it and familiarize yourself with the basics. Maybe even walk through some tutorials (Google "MATLAB tutorials").

  Let $\mathtt{a} = [5, 7, -3, 2, 8, 16]$. Let $\mathtt{x}$ be the vector in terms of $\mathtt{a}$ which you solved for in exercise 17. Calculate $\mathtt{x} - \mathtt{a}$ and $2(\mathtt{x} - 2\mathtt{a})$. According to exercise 17, these should be equal. Are they? (Hint: if they're not, you made a mistake in either exercise 17 or MATLAB)

  I would like you to print out your code and turn it in. However, raw code is not very fun to read! Please summarize your conclusions; for example,

  $$\mathtt{x} - \mathtt{a} = \ldots$$

  $$2(\mathtt{x} - 2\mathtt{a}) = \ldots$$

  These two quantities are equal, justifying the calculation in exercise 17.

Date: Spring 2008.

Questionnaire for MATH 215 – Linear Algebra
Tom LaGatta – Spring 2008

Name	
What do you prefer to be called? (e.g. Tom instead of Thomas)	
Email address	
Year (circle one)	Freshman Sophomore Junior Senior Other:
Major(s)	
Why are you taking linear algebra?	
Will you take vector calculus? (circle one)	a. Already took it b. Taking it right now c. Plan to take it d. Do not plan to take it
Please list any other math, physics, or engineering classes you've taken	
Where did you live before Tucson? (Native Tucsonans: which high school?)	
Tell me something unique about yourself	