

Math 19620/20 Homework 2

Due: Thursday, October 18, 2018, at **5:00pm** in my mailbox in the basement of Eckhart (You can also give it to me in class on Thursday if you prefer.)

Please present your solutions clearly and in an organized way. Think of it this way: if you show it to another student in this class, he/she should be able to understand it without needing to ask you questions.

October 11

Goal:

- Work with some examples of linear transformations and see what they do geometrically

Exercises 1.3:

- 47

Exercises 2.1:

- 16, 17, 18, 19, 20, 21, 22, 23 (Ignore the last two sentences of the instructions in the textbook – you don't need to determine if the transformations are invertible and you don't need to find the inverse.)

October 16

Goal:

- Go back and forth between the geometric description of a linear transformation and the formula with a matrix.

Exercises 2.2:

- 19, 20 (We didn't talk about 3D transformations in class today, but the process is the same. Determine what $T(\vec{e}_1), T(\vec{e}_2), T(\vec{e}_3)$ are. Your answers should be 3×3 matrices.)
- 26 a, b, c, d (It is possible to do part *c* *without any trigonometry*. But if you prefer, you can do this with inverse trig functions.)
- 32 (You do *not* need to know any trigonometric identities to do this problem. You only need the unit-circle definitions of sine and cosine. See, e.g., [this video from Khan Academy](#).)