Math178 SU19
Homework 4
Due: Mon, June 10, 2019

Feel free to work with other students, but make sure you write up the homework and code on your own (no copying homework *or* code; no pair programming). Feel free to ask students or instructors for help debugging code or whatever else, though.

Note: You need to create a Github account for submission of the coding part of the homework. Please create a repository on Github to hold all your code and include your Github account username as part of the answer to the coding problems.

1 (**Rigid Body.**) Recall that

$$SE(3) = \left\{ A \,\middle|\, A = \begin{bmatrix} R & \vec{v} \\ \mathbf{0}_{3\times 1} & 1 \end{bmatrix},\ R \in \mathbb{R}^{3\times 3}, \vec{v} \in \mathbb{R}^3, R^T R = R R^T = I, \det|R| = 1 \right\},$$

where R is rotation and $\vec{v}$ is translation. Show that $SE(3)$ is a group.

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