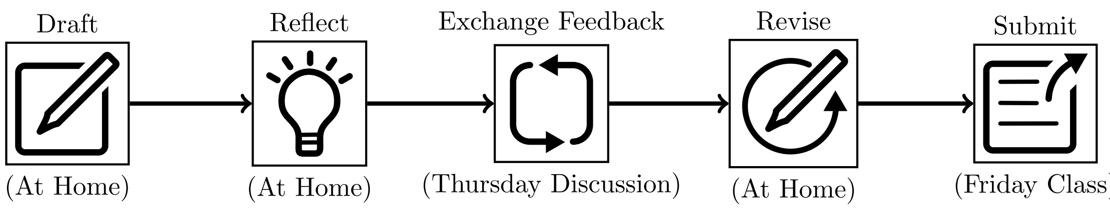
MATH 240 — **Due: 10/27 (draft), 10/28 (final)**

PAR 4 (*October 21, 2016*) — **Name:**_________________________

The PAR Process



Note: Your PAR (both initial and final drafts) must be typed in LaTeX.

Problem Statement

1. Is there a linear transformation $\mathcal{T}$ such that $\mathcal{T}(\langle 1,-1\rangle) = \langle 1,1\rangle$ and $\mathcal{T}(\langle -1,1\rangle) = \langle -1,-1\rangle$? Either give a matrix for such a transformation, or explain why there isn't one.
2. Is there a linear transformation $\mathcal{R}$ such that $\mathcal{R}(\langle 1,1\rangle) = \langle 1,-1\rangle$, and $\mathcal{R}(\langle -1,-1\rangle) = \langle -1,1\rangle$? Either give a matrix for such a transformation, or explain why there isn't one.
3. If you answered "yes" to either of the above questions, are there other linear transformations that do the same thing? Give an example, or explain why there aren't.

Suppose $\{v_1, v_2, v_3\}$ is a linearly independent set, and $\{w_1, w_2, w_3\}$ is a linearly dependent set in $\mathbb{R}^3$.

4. Is there a linear transformation $\mathcal{P}$ such that $\mathcal{P}(v_i) = w_i$ for $i = 1, 2, 3$?
5. Is there a linear transformation $\mathcal{Q}$ such that $\mathcal{Q}(w_i) = v_i$ for $i = 1, 2, 3$?

For problems 4 and 5, PROVE your answer! (Hint: You will need to use the definition of a linear transformation.)

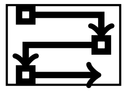
LaTeXnote: To make fancy script letters, add the line `\usepackage{amsfonts}` to your preamble, and use the command `\mathcal{T}`, for example. (Once you've loaded this package, you can play around with other fun fonts like `\mathbb` and `\mathfrak`, too.)

Reflection

Turn the page and check off the icons for things you think you did well; circle the icons for things you would like feedback on.

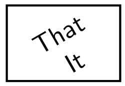
Feedback Provided By:____________________________

Suggestions	Communication	**Strengths**

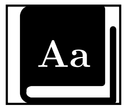


Show All Steps

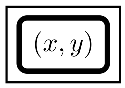
Explain Why,
Not Just What



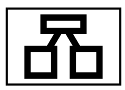
Avoid Pronouns



Use Correct
Definitions

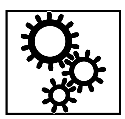


Define Variables,
Units, etc.

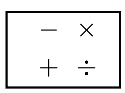


Create Diagrams

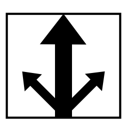
Suggestions	Accuracy	**Strengths**



Correct Setup

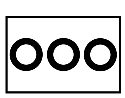


Accurate Calculations



Solve Multiple Ways

Answer Reasonable



Other
(Write Below)