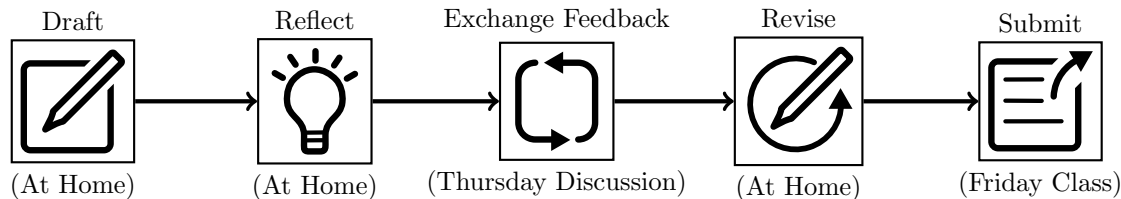


The PAR Process



Problem Statement

Let M be a 3×4 matrix with unknown entries. You do know, however, that $\text{rref}(M) = \begin{bmatrix} 1 & 2 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$.

1. Is there a vector \vec{b} such that the matrix equation $M\vec{x} = \vec{b}$ is *consistent*? Explain why or why not, or whether you'd need more information to tell.
2. Is there a vector \vec{b} such that the matrix equation $M\vec{x} = \vec{b}$ is *inconsistent*? Explain why or why not, or whether you'd need more information to tell.
3. Let $\vec{c}_1, \vec{c}_2, \vec{c}_3$, and \vec{c}_4 be the columns of the matrix M . For which i and j with $i \neq j$ is the set $\{\vec{c}_i, \vec{c}_j\}$ linearly dependent? For which is it linearly independent? Explain how you know.
4. Can a set of four vectors in \mathbb{R}^3 ever be linearly independent? Explain.
5. Suppose $\vec{v}_1, \vec{v}_2, \vec{v}_3, \vec{v}_4 \in \mathbb{R}^3$. Let $\mathcal{V} = \{\vec{v}_1, \vec{v}_2, \vec{v}_3, \vec{v}_4\}$ and let $X = [\vec{v}_1 | \vec{v}_2 | \vec{v}_3 | \vec{v}_4]$ be the matrix whose columns are $\vec{v}_1, \vec{v}_2, \vec{v}_3, \vec{v}_4$. Suppose further that every subset of $\mathcal{V} \subset \mathcal{V}$ of *size two* is linearly independent. Explain what $\text{rref}(X)$ must look like in this case. (*Hint: you won't be able to pin down exact numbers for every entry of $\text{rref}(X)$, but you might know things like whether the entry can be zero or not, etc.*)

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.

Suggestions

Communication

Strengths



Show All Steps



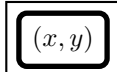
Explain Why,
Not Just What



Avoid Pronouns



Use Correct
Definitions



Define Variables,
Units, etc.

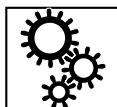


Create Diagrams

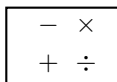
Suggestions

Accuracy

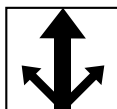
Strengths



Correct Setup



Accurate Calculations



Solve Multiple Ways



Answer Reasonable



Other
(Write Below)