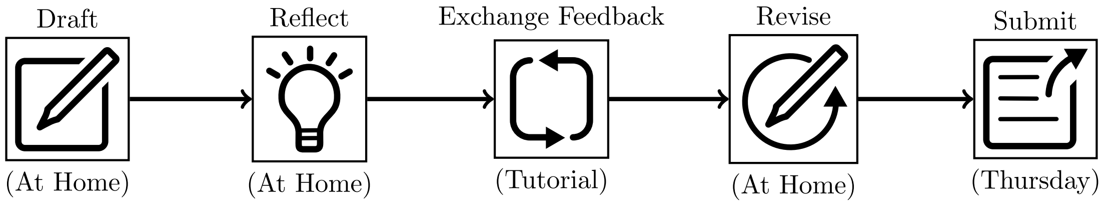
MAT224 **Due: Week 10 Tutorial (draft), March 15 (final)**
PAR 6 **Name:**____________________________

The PAR Process



A *random vector* in $\mathbb{R}^n$ is a vector whose components (when written in the standard basis) are independently and uniformly chosen random numbers in the interval $[0, 1]$.

Random Vector Theorem: Let $\mathcal{V} \subset \mathbb{R}^n$ be a subspace of $\mathbb{R}^n$ of dimension $m < n$ and let $\vec{x} \in \mathbb{R}^n$ be a random vector. The probability that $\vec{x} \in \mathcal{V}$ is zero.

Problem Statement

Let $\vec{x}_1, \dots, \vec{x}_n \in \mathbb{R}^n$ be n random vectors.[1] Prove that there is a 100% chance that $\{\vec{x}_1, \dots, \vec{x}_n\}$ form a basis for $\mathbb{R}^n$.

Hint: the random vector theorem is your friend. Use it!

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.

[1] If you are familiar with probability theory, $\vec{x}_1, \dots, \vec{x}_n$ are independent random variables—which is a distinct concept from linear independence.

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)	