Observations

Here are some observations so far:

- the pivot columns of a matrix are linearly independent (why?)
- each of the free variable columns of a matrix can always be written as a linear combos of the pivot columns (why?)
- any n vectors in $\mathbb{R}^m$ when $n > m$ are _____ (fill in the blank)

Definition: Vectors $v_1, v_2, ..., v_k$ **span** a vector space V if every vector v in V can be written as a linear combo of $v_1, v_2, ..., v_k$. We write

$$V = \text{Span}\{v_1, v_2, ..., v_k\}$$

Ex:

$$C(A) = \text{Span}\{ \text{ the columns of } A \}$$