## Today: § 1.4: The Matrix Equation Ax= b

## & § 1.5: Solution Sets

## Next: § 1.7: Linear Independence

Reminders:

My MathLab Homework #1 & #2: Due Mon, Jan 22

MATLAB Homework #1: Due TONIGHT!

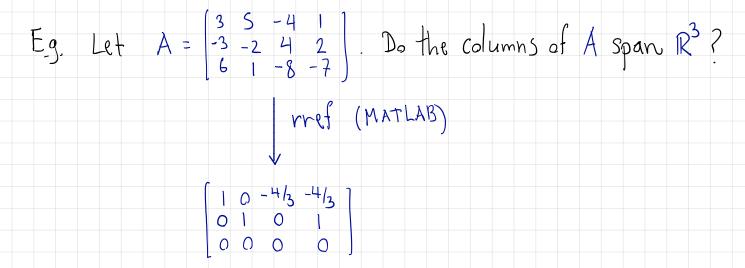
<u>Theorem</u>: Let A be an m×n matrix. The following four statements are equivalent.

(a) Ax=b can be solved for x, for any beIR.

(b) Every vector beter is a linear combination of the columns of A.

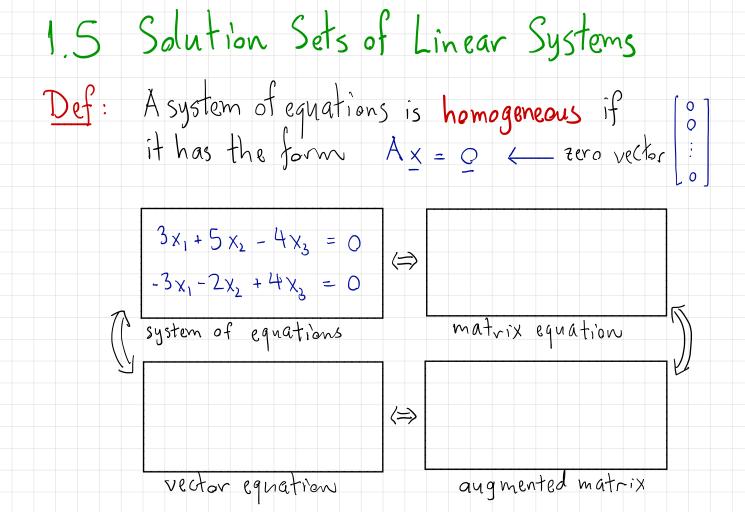
(c) The columns of A span R<sup>m</sup>.

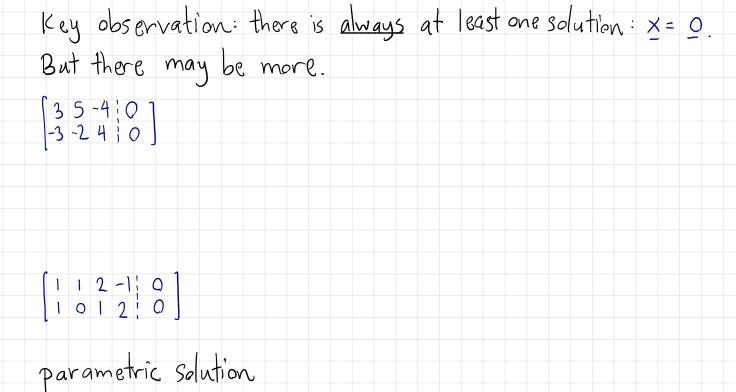
(d) A has a privot in each now.



Question: Is of in the span of the columns of A?

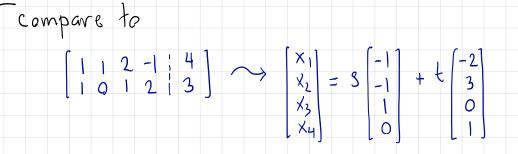
 $\begin{bmatrix} 3 & 5 & -4 & 1 & 0 \\ -3 & -2 & 4 & 2 & 0 \\ 6 & 1 & -8 & -7 & 1 \end{bmatrix}$ 

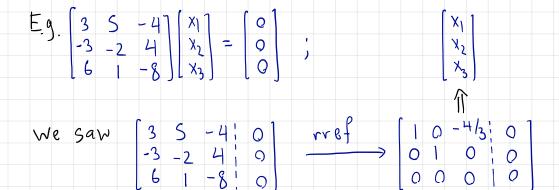




Inhomogeneous systems are linear systems that are not homogeneous.

- i.e. Ax = b where  $b \neq 0$ .
- Eg. [1 1 2 -1 ; 4] 1 0 1 2 3]





We also saw

