

Math 225, Fall 2011
Worksheet on Bases
October 25, 2011

Let

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

- 1) The rows of A span a subspace of \mathbb{R}^5 called the *row space* of A . Find a basis of the row space of A .
- 2) What is the row rank of A ?

- 3) Find a basis of the null space of A .
- 4) Take the basis of the null space of A from 3) and add some vectors to it to form a basis of \mathbb{R}^5 .
- 5) Take the basis of the row space of A from 1) and add some vectors to it to form a basis of \mathbb{R}^5 .

- 6) Find a basis of the column space of A .
- 7) What is the column rank of A ?
- 8) Take the basis of the column space of A in 6) and add some vectors to it to form a basis of \mathbb{R}^3 .

9) What changes in 1)-8) if you use instead of A a matrix that is obtained from A by interchanging two rows?

10) What changes in 1)-8) if you use instead of A a matrix that is obtained from A by interchanging two columns?