

WORKSHEET 9/14/22
MATH 2331, FALL 2022

- (1) How large can the rank of a matrix be?
- (2) What can you say about the number of solutions to a system of linear equations assuming the rank of its coefficient matrix is
- (a) equal to the number of rows?
 - (b) less than the number of columns?
 - (c) equal to the number of columns?
- (3) Calculate the matrix product using dot products, or explain why it is undefined.

(a)

$$\begin{bmatrix} 0 & 1 \\ 3 & 2 \end{bmatrix} \begin{bmatrix} 2 \\ -3 \end{bmatrix}$$

(b)

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

(c)

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

- (4) Calculate the matrix products above using linear combinations instead.