

MAT 532 — HOMEWORK 4

DUE ON MONDAY, FEBRUARY 26

Reading. Read sections 5.5, 5.6, and 6.1 carefully.

Problems. Only the **bold-faced problems** will be collected. (This includes the two written out, for a total of 7.)

5.5: Column space, row space, null space.

#3b, **5b**, 7b

5.6: Rank & nullity

#2bc, **3bc**

Also: If A is a 6×4 matrix such that the first and third columns are multiples of each other, what can you say about the dimension of the space of solutions to $A\vec{x} = \vec{0}$?

6.1: Inner products

#3a, 4a, **6b**, 10abc, **17ab**, **28a**

EXTRA: Consider the following cartoon¹. Explain why the minus sign is where it is.

$$\begin{bmatrix} \cos 90^\circ & \sin 90^\circ \\ -\sin 90^\circ & \cos 90^\circ \end{bmatrix} \begin{bmatrix} a_1 \\ a_2 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$$

¹<http://xkcd.com/c184.html>