Hints for homework problems

Math 20610, Spring 2026
Assignment, due 3/27/26

1. §3.3 #18 You're supposed to do this by inspection, not by doing a bunch of calculations. So the hint is that the third column is a linear combination of the first two (but I leave to you to find the linear combination). What can you say about the fourth column?

2. §3.3 #30 Think of the linear transformation $T : \mathbb{R}^3 \to \mathbb{R}$ defined by

$$\begin{bmatrix} 2 & -1 & 2 & 4 \end{bmatrix}$$

3. §3.3 #36 Think about the rank-nullity theorem.

4. §3.3 #67 Remove redundant vectors in the column space. Why can you leave the v_i alone?

5. §3.3 #81 Argue by contradiction. If they are dependent, how do you know at least one must be redundant, hence can be removed?