Hints for homework problems

Math 20610, Spring 2026
Fifth assignment, due 2/20/26

1. §2.3 # 32. You have to show that your solution(s) for X will satisfy $AX = XA$ no matter what you choose for A. So let $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ and let $X = \begin{bmatrix} x_1 & x_2 \\ x_3 & x_4 \end{bmatrix}$, work out both products (getting two different 2×2 matrices in the variables $a, b, c, d, x_1, x_2, x_3, x_4$) and see what x_1, x_2, x_3, x_4 will work for *every* choice of a, b, c, d.

2. §2.3 # 61.

   (a) First hint: if $\begin{bmatrix} 1 & 2 & 3 \\ 0 & 1 & 2 \end{bmatrix} X = I_2$, what size does X have to be?

   (b) Approach it as we did in the hint for #32.

3. §2.3 # 62. Same hint as #61 but this time use $\begin{bmatrix} 1 & 0 \\ 2 & 1 \\ 3 & 2 \end{bmatrix}$.