

(This is the coversheet for the homework. The actual solutions should be worked out neatly on single-sided with each problem labeled (for example: Problem 1, 1.1 #14) and the answer boxed. Those additional sheets are then to be stapled with a metal staple in the upper left corner in such a way that no work is obscured. Failure to follow the style outlined here will result in a loss of credit. The problems refer to Anton and Rorres 10th ed. of *Elementary Linear Algebra: applications version.*)

Problem 13 Suppose that $AB = \begin{bmatrix} 5 & 4 \\ -2 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 7 & 3 \\ 2 & 1 \end{bmatrix}$. Calculate A .

Problem 14 § 1.4 # 8 (hint: $\cos(-\theta) = \cos(\theta)$, $\sin(-\theta) = -\sin(\theta)$ makes answer neat)

Problem 15 § 1.4 # 30 (symbolic matrix algebra problem)

Problem 16 § 1.5 # 14 (find the inverse, do not use technology for solution, show work)

Problem 17 § 1.5 # 26a (find the inverse, do not use technology for solution, show work)

Problem 18 § 1.5 # 32 (inverse is product of elementary matrices)

Problem 19 § 1.6 # 4 (you can use technology to find the inverse)

Problem 20 § 1.6 # 12 (you can use technology to calculate the rref)

Problem 21 § 1.6 # 14 (find conditions on b_1, b_2 to make $Ax = b$ consistent)

Problem 22 § 1.7 # 34 (matrix algebra problem, involves powers of diagonal matrices)

Problem 23 § 1.8 # 2 (you can use tech. to find an rref here)

Problem 24 § 1.8 # 8 (you can use tech. to find an rref here)

Problem 25 § 1.8 # 10 (you can use tech. to find an rref here)

Problem 26 supplementary exercise # 16 on page 92 (you can use tech. to find an rref here)

Problem 27 Let $Z = \begin{bmatrix} a & c \\ b & d \end{bmatrix}$. Recall that there are no real solutions of the equation $x^2 + 1 = 0$.

The same is not true for matrices. Show that $J = \begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$ solves $Z^2 + I = 0$. Let $a, b, c, d \in \mathbb{R}$ and define $Z = aI + bJ$ and $W = cI + dJ$. Calculate ZW and interpret what this calculation represents. Hint: use your *imagination*.