

Supplementary problems: 8.1 # 14, 18, 21, 23, 26, 35, 42; 8.2 # 1, 5, 11, 12, 14; 8.4 # 13, 15, 19, 20; 8.6 # 1, 3, 4, 5, 27, 29
Quiz: 8.1 - 8.6

Compulsory problems:

(1) Consider the following matrices:

$$A = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 1 & 1 \end{bmatrix}; \quad B = \begin{bmatrix} 1 & 0 & 0 \\ -2 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

- (a) [3 pts.] Compute AB .
(b) [3 pts.] Compute BA
(c) [1 pt.] Do A and B commute? (show why or why not)
- (2) [8 pts.] Show that the determinant of M is the same as that of M^T

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

(3) Consider the following system of equations,

$$\begin{aligned} x + 2y &= 5 \\ 2x + \alpha y &= 4 \end{aligned}$$

- (a) [3 pts.] Solve for x and y in terms of α .
(b) [5 pts.] For what value of α does the system have no solution? Show your work.
(c) [2 pts.] Is there an α for which the system has infinitely many solutions? If “yes” find it, otherwise explain why not.

Your homework raw score is: $\frac{n}{2m} \cdot M + \left(1 - \frac{n}{2m}\right) \cdot N = N + \frac{n}{2m}(M - N)$. For this homework, $M = 25$, $m = 22$, N is the number of compulsory problems you get correct, and n is the number of supplementary problems you complete. It should be noted that for the supplementary problems I will be looking for **full completion**, but I won't take off points for mistakes.