16(2). Suppose $A$ is $n \times n$.
(a) Show that $A + A^T$ is symmetric.

(b) Show that $A - A^T$ is skew symmetric.

18(2). Suppose $A$ and $B$ are symmetric $n \times n$ matrices.
(a) Show that $A + B$ is symmetric.

(b) Show that $AB$ is symmetric iff $AB = BA$.

26(2). Find $A$ if $A$ is nonsingular and $A^{-1} = \begin{bmatrix} 2 & 1 \\ 4 & 1 \end{bmatrix}$.

28(2). $A^{-1} = \begin{bmatrix} 1 & 2 \\ 1 & 3 \end{bmatrix}$. Solve $AX = B$ if
(a) $B = \begin{bmatrix} 4 \\ 6 \end{bmatrix}$
(b) $B = \begin{bmatrix} 8 \\ 15 \end{bmatrix}$

36(2). Suppose $AB = AC$ and $A$ is nonsingular. Prove $B = C$.

38(2). Suppose $A$ is symmetric and nonsingular. Prove $A^{-1}$ is symmetric.

42'(3) (A problem with a ‘ has been modified, it differs from text version.)

Partition $X$, $Y$, and $Z$ each into four $2 \times 2$ matrices.

Write each $Z_i$ in terms of the $X_i$ and $Y_i$'s and then calculate it.

$Z_1$ has been done for you. Do $Z_2$, $Z_3$, and $Z_4$.

Finally write $Z$ which is $4 \times 4$ and whose entries sum to 20.