

§ 2.7 Solutions

① $A^T = \begin{bmatrix} 1 & 9 \\ 0 & 3 \end{bmatrix}$

$$A^{-1} = \begin{bmatrix} 1 & -3 \\ 0 & 1/3 \end{bmatrix}$$

$$(A^{-1})^T = \begin{bmatrix} 1 & 0 \\ -3 & 1/3 \end{bmatrix} = (A^T)^{-1}$$

③ $((AB)^{-1})^T = (B^{-1}A^{-1})^T = (A^{-1})^T(B^{-1})^T$

⑤ (A) 5
(B) $[4 \ 5 \ 6]$
(C) $\begin{bmatrix} 2 \\ 5 \end{bmatrix}$

⑦ (A) FALSE, A must be symmetric too!

(B) FALSE, to be symmetric $AB = (AB)^T$
but $(AB)^T = B^T A^T$.

(C) TRUE.

(D) TRUE.

16. (A) and (C)

17. (A) $A = \begin{pmatrix} 1 & 0 \\ 0 & 0 \end{pmatrix}$.

19. $(R^T A R)^T = R^T A^T (R^T)^T = R^T A R$ proves
 $R^T A R$ is symmetric, and it is $n \times n$.