

1.3.3 Answers to Exercise.

1. (a) i. $A^t = \begin{bmatrix} 1 & 1 & -1 \\ 1 & 0 & 1 \\ 0 & 1 & -1 \\ -1 & 0 & 0 \end{bmatrix}$.
ii. The first row of $2A^t + 3B$ is given by $[5 \ 5 \ 1]$.
(b) $u = 1, v = 0, w = 2$.
2. —
- 3.
4. —
5. (a) 3
(b) 1
(c) $AA^t = 2I_7 + 1J_7$.
6. —
7. —
8. —
9. —
10. (a) —
(b) $A^2 = p(\mathbf{u}\mathbf{v}^t + \mathbf{v}\mathbf{u}^t) - (\mathbf{u}\mathbf{u}^t + \mathbf{v}\mathbf{v}^t)$.
(c) $A^3 = (p^2 - 1)A$.
11. (a) Skew-symmetric.
(b) Symmetric.
(c) Symmetric.
(d) Symmetric.
(e) Symmetric.
(f) Symmetric.
(g) Skew-symmetric.
(h) Skew-symmetric.
12. (a) —
(b) —
(c) A counter-example is provided by $C = \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$.