Assignment

Section 6.3: 1, 2, 3, 9; Section 6.4: 1, 2, 9, 11; Section 6.5: 1, 2, 5, 10, 21

Work

6.3

1. Label the following statements as true or false. Assume the underlying inner product spaces are finite-dimensional.

   (a) Every linear operator has an adjoint.

   (b) Every linear operator on V has the form $x \to \langle x, y \rangle$ for some $y \in V$.

   (c) For every linear operator T on V and every ordered basis β for V, we have $[T^*]_\beta = ([T]_\beta)^*$.

   (d) The adjoint of a linear operator is unique.

   (e) For any linear operators T and U and scalars a and b,

$$(aT + bU)^* = aT^* + bU^*$$

   (f) For any $n \times n$ matrix A, we have $(L_A)^* = L_A$

   (g) For any linear operator T, we have $(T^*)^* = T$

   2. 3.

   9.

6.4

   1.

   2.

   9.

   11.

6.5

   1.

   2.

   5.

10.

21.