Solution 3: Vector Space and Linear Transform

(1) \times \text{ since it violates (A5).}

(2) \bigcirc

(3) \bigcirc

(4) [c_1, c_2, c_3] = [1, 1, 2]

(5) [1, 2, 3]

(6) A basis (linearly independent and a spanning set for } \mathbb{R}^3\).

(7) [6, -7]^t

(8) \{\alpha[1, 1, -2]^t\}