



LINEAR ALGEBRA

— MA 242 —

Solutions to even problems

HW 4

1.8.

8: 7 rows and 5 columns **24:** Let $T(x) = Ax + b$ and $b \neq 0$. Then $T(0) = A0 + b = b \neq 0$. One can also show that both properties of a linearity transformation fail.

30: The fact that v_1, \dots, v_p spans \mathbb{R}^n means that for $x \in \mathbb{R}^n$ there are constants c_1, \dots, c_n such that $x = c_1v_1 + \dots + c_nv_n$. Then, due to linearity, $T(x) = T(c_1v_1 + \dots + c_nv_n) = c_1T(v_1) + \dots + c_nT(v_n) = 0$ for any $x \in \mathbb{R}^n$.

1.9.

20: $A = [3 \ 0 \ 4 \ -2]$. **24** a. False, see Theorem 12. b. True, see Theorem 10. c. True, see Theorem 10. d. False. See definition of one-to-one. Any function from \mathbb{R}^{\times} to \mathbb{R}^{\times} maps a vectors onto a single (unique) vector. e. False. See Table 3.