

Answer key for MATH 1300 midterm test, October 2007

1. a) $x_1 = 4, x_2 = 1$
b) $x = 10 + 2t, y = t, z = 6, t \in \mathbb{R}$.

2. a) $a = 0$, any $b \neq 0$
b) $a \neq 0$, any b
c) $a = 0, b = 0$; solutions $x = 2t + 1, y = 0, z = t, t \in \mathbb{R}$.

3. a) $A = \begin{bmatrix} 4/3 & 2/3 \\ -2/3 & 2/3 \end{bmatrix}$, b) $A^T = \begin{bmatrix} 4/3 & -2/3 \\ 2/3 & 2/3 \end{bmatrix}$, c) $\text{adj}(A) = \begin{bmatrix} 2/3 & -2/3 \\ 2/3 & 4/3 \end{bmatrix}$.

4. a) undefined since $(2 \times 3)(2 \times 2)$ not possible

b) $CA^T = \begin{bmatrix} -2 & 2 \\ 1 & -1 \\ 1 & -1 \end{bmatrix}$

c) $B^2A = \begin{bmatrix} 1 & 2 & 3 \\ -1 & -2 & -3 \end{bmatrix}$

- d) $A + C$ not possible since A is 2×3 and C is 3×3 .

5. $A^{-1} = \begin{bmatrix} -1 & -2 & 1 \\ 0 & -6 & 2 \\ 0 & -2 & 1 \end{bmatrix}$.

6. a) i. -7 , ii. 21 , b) -24 .