

M308D HW 1 answers

Sec 1.1

2. Nonlinear

6. Linear

20.  $C = \begin{bmatrix} 1 & 2 & 7 & 1 \\ 2 & 2 & 4 & 3 \end{bmatrix}$

26.  $A = \begin{bmatrix} 1 & 3 & -1 \\ 2 & 5 & 1 \\ 1 & 1 & 1 \end{bmatrix}$   $B = \begin{bmatrix} 1 & 3 & -1 & 1 \\ 2 & 5 & 1 & 5 \\ 1 & 1 & 1 & 3 \end{bmatrix}$

32. Elementary operations on eqs:  $E_1 \leftrightarrow E_2, E_3 - 2E_1$

Reduced system of eqs:  $\begin{cases} x_1 - x_2 + 2x_3 = 1 \\ x_2 + x_3 = 4 \\ 3x_2 - 5x_3 = 4 \end{cases}$

Elementary row operations:  $R_1 \leftrightarrow R_2, R_3 - 2R_1$

Reduced augmented matrix:  $\begin{bmatrix} 1 & -1 & 2 & 1 \\ 0 & 1 & 1 & 4 \\ 0 & 3 & -5 & 4 \end{bmatrix}$

Sec 1.2

18. inconsistent

28.  $x_1 = 2x_3, x_2 = 1, x_3$  arbitrary

Sec 1.3

2. Reduced augmented matrix  $\begin{bmatrix} 1 & 0 & -3/2 \\ 0 & 1 & 2 \\ 0 & 0 & 0 \end{bmatrix}, n = 2, r = 2$

4. Reduced augmented matrix  $\begin{bmatrix} 1 & 2 & 3 & 0 & 1/3 \\ 0 & 0 & 0 & 1 & 1/3 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}, n = 4, r = 2, x_2, x_3$

are independent var.

14.  $\infty$  many sols

16.  $\infty$  many sols or unique sol

18.  $\infty$  many sols