

WORKSHEET 9/8/22
MATH 2331, FALL 2022

(1) For each augmented matrix, write down the corresponding system of linear equations.

(a)

$$\left[\begin{array}{ccc|c} 1 & 0 & 0 & 4 \\ 0 & 1 & 0 & 3 \\ 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 0 \end{array} \right]$$

(b)

$$\left[\begin{array}{ccc|c} 1 & 0 & 0 & 4 \\ 0 & 1 & 7 & 3 \end{array} \right]$$

(c)

$$\left[\begin{array}{ccc|c} 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{array} \right]$$

(d)

$$\left[\begin{array}{ccc|c} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{array} \right]$$

(2) Find all 3×2 matrices in reduced row-echelon form which have two leading 1s.

(3) Find all 2×3 matrices in reduced row-echelon form which have two leading 1s.

(4) Consider the following system of equations:

$$\begin{aligned} 2x + 4y - 2z &= -10 \\ 3x + 6y &= -12 \\ y + z &= 3 \end{aligned}$$

- (a) What is the coefficient matrix A of the system?
- (b) What is the augmented matrix of the system?
- (c) Use Gauss–Jordan elimination to solve the system.
- (d) What is the reduced row echelon form of A (notation: $\text{rref}(A)$)?