Math 1210 Tutorial 7

Use Gaussian elimination to find all solutions for each of the following systems of equations:

1.

$$\begin{aligned} 2x + 3y - 4z + w &= 16, \\ y + 2z - 3w &= -12, \\ 3x - y + 2w &= 9, \\ 2x + y + z &= 3. \end{aligned}$$

2.

$$\begin{aligned} 2x + 3y - 4z + w &= 3, \\ x - 2y + z &= 6, \\ 3x + y + w &= 4, \\ 6x + 2y - 3z + 2w &= 13. \end{aligned}$$

3.

$$\begin{aligned} x + 5y + 3z - 2w &= 6, \\ 2x - y + z &= -1, \\ x + 2y - 4w &= 6, \\ 3x + 7y + 7z &= 3. \end{aligned}$$

Answers:

1. $x = 1$, $y = 2$, $z = -1$, $w = 4$

2. $x = \dfrac{47}{21} - \dfrac{2t}{7}, \quad y = -\dfrac{19}{7} - \dfrac{t}{7}, \quad z = -\dfrac{5}{3}, \quad w = t$

3. No solutions