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Analytical Methods (ACHA 4000)

$$d) A = \begin{pmatrix} 2 & 3 & 2 \\ 1 & 2 & 5 \\ 3 & 1 & -2 \end{pmatrix} \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 14 \\ 4 \\ 19 \end{pmatrix} \quad |A| = 2(-9) - 3(-17) + 2(-5) = 23$$

$$A_1 = \begin{pmatrix} 14 & 3 & 2 \\ 4 & 2 & 5 \\ 19 & 1 & -2 \end{pmatrix} \quad |A_1| = 14(-9) - 3(-103) + 2(-34) = 115$$

$$A_2 = \begin{pmatrix} 2 & 14 & 2 \\ 1 & 4 & 5 \\ 3 & 19 & -2 \end{pmatrix} \quad |A_2| = 2(-103) - 14(-17) + 2 \times 7 = 46$$

$$A_3 = \begin{pmatrix} 2 & 3 & 14 \\ 1 & 2 & 4 \\ 3 & 1 & 19 \end{pmatrix} \quad |A_3| = 2 \times 34 - 3 \times 7 + 14(-5) = -23$$

$$x = \frac{|A_1|}{|A|} = 5$$

$$y = \frac{|A_2|}{|A|} = 2$$

$$z = \frac{|A_3|}{|A|} = -1$$