Problems for exercise – Gauss-Jordan method for systems of linear algebraic equations

Solve the systems using the Gauss-Jordan method by choosing or not choosing a main element. Work with simple fractions:

a)
$$\left|\begin{array}{rrrr} 10x_1 & -7x_2 & & = 7 \\ -3x_1 & +2x_2 & +6x_3 & = 4 \\ 5x_1 & -x_2 & +5x_3 & = 6 \end{array}\right.$$

Answer: (0, -1, 1)

b)
$$\left|\begin{array}{rrrr} x_1 & +2x_2 & +3x_3 & = 7 \\ -2x_1 & -4x_2 & -5x_3 & = -12 \\ 3x_1 & +5x_2 & +6x_3 & = 15 \end{array}\right.$$

Answer: (1, 0, 2)

c)
$$\left|\begin{array}{rrrr} x_1 & +3x_2 & +2x_3 & = 0 \\ -3x_1 & -3x_2 & -x_3 & = 5 \\ 2x_1 & +x_2 & & = -4 \end{array}\right.$$

Answer: (-2, 0, 1)

d)
$$\left|\begin{array}{rrrrr} x_1 & +2x_2 & -3x_3 & +x_4 & = -6 \\ -x_1 & -x_2 & +2x_3 & & = 3 \\ 2x_1 & +x_2 & +2x_3 & -x_4 & = 12 \\ & x_2 & -x_3 & +2x_4 & = -4 \end{array}\right.$$

Answer: (2, 1, 3, -1)

e)
$$\left|\begin{array}{rrrrr} x_1 & -x_2 & +2x_3 & -x_4 & = 18 \\ 2x_1 & & +x_3 & +x_4 & = 3 \\ -x_1 & +x_2 & & -x_4 & = 0 \\ 3x_1 & +2x_2 & -x_3 & & = -4 \end{array}\right.$$

Answer: (2, -3, 4, -5)

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