Практическая работа №21-23
Системы линейных алгебраических уравнений

Цель: Проверить умения учащихся решать системы линейных уравнений по правилу Крамера, с помощью обратной матрицы (матричным методом), методом Гаусса.

Задание:
1. Решить системы уравнений:
а) по формуле Крамера;
б) с помощью обратной матрицы (матричным методом);
в) Методом Гаусса.

1.1. $\begin{cases} 2x + y + 3z = 7, \\ 2x + 3y + z = 1, \\ 3x + 2y + z = 6. \end{cases}$
1.2. $\begin{cases} 2x - y + 2z = 3, \\ x + y + 2z = -4, \\ 4x + y + 4z = -3. \end{cases}$
1.3. $\begin{cases} 3x - y + z = 12, \\ x + 2y + 4z = 6, \\ 5x + y + 2z = 3. \end{cases}$

1.4. $\begin{cases} 2x - y + 3z = -4, \\ x + 3y + 3z = 11, \\ x - 2y + 2z = -7. \end{cases}$
1.5. $\begin{cases} 3x - 2y + 4z = 12, \\ 3x + 4y - 2z = 6, \\ 2x - y - z = -9. \end{cases}$
1.6. $\begin{cases} 8x + 3y - 6z = -4, \\ x + y - z = 2, \\ 4x + y - 3z = -5. \end{cases}$

1.7. $\begin{cases} 4x + y - 3z = 9, \\ x + y - z = -2, \\ 8x + 3y - 6z = 12. \end{cases}$
1.8. $\begin{cases} 2x + 3y + 4z = 33, \\ 7x - 5y = 24, \\ 4x + 11z = 39. \end{cases}$
1.9. $\begin{cases} 2x + 3y + 4z = 12, \\ 7x - 5y + z = -33, \\ 4x + z = -7. \end{cases}$

1.10. $\begin{cases} x + 4y - z = 6, \\ 5y + 4z = -20, \\ 3x - 2y + 5z = -22. \end{cases}$
1.11. $\begin{cases} 3x - 2y + 4z = 21, \\ 3x + 4y - 2z = 9, \\ 2x - y - z = 10. \end{cases}$
1.12. $\begin{cases} 3x - 2y - 5z = 5, \\ 2x + 3y - 4z = 12, \\ x - 2y + 3z = -1. \end{cases}$

1.13. $\begin{cases} 4x + y + 4z = 19, \\ 2x - y + 2z = 11, \\ x + y + 2z = 8. \end{cases}$
1.14. $\begin{cases} 2x - y + 2z = 0, \\ 4x + y + 4z = 6, \\ x + y + 2z = 4. \end{cases}$
1.15. $\begin{cases} 2x - y + 2z = 8, \\ x + y + 2z = 11, \\ 4x + y + 4z = 22. \end{cases}$

1.16. $\begin{cases} 2x - y - 3z = -9, \\ x + 5y + z = 20, \\ 3x + 4y + 2z = 15. \end{cases}$
1.17. $\begin{cases} 2x - y - 3z = 0, \\ 3x + 4y + 2z = 1, \\ x + 5y + z = -3. \end{cases}$
1.18. $\begin{cases} -3x + 5y + 6z = -8, \\ 3x + y + z = -4, \\ x - 4y - 2z = -9. \end{cases}$

1.19. $\begin{cases} 3x + y + z = -4, \\ -3x + 5y + 6z = 36, \\ x - 4y - 2z = 19. \end{cases}$
1.20. $\begin{cases} 3x - y + z = -11, \\ 5x + y + 2z = 8, \\ x + 2y + 4z = 16. \end{cases}$
1.21. $\begin{cases} 3x - y + z = 9, \\ 5x + y + 2z = 11, \\ x + 2y + 4z = 19. \end{cases}$

1.22. $\begin{cases} 2x + 3y + z = 4, \\ 2x + y + 3z = 0, \\ 3x + 2y + z = 1. \end{cases}$
1.23. $\begin{cases} 2x + 3y + z = 12, \\ 2x + y + 3z = 16, \\ 3x + 2y + z = 8. \end{cases}$
1.24. $\begin{cases} x - 2y + 3z = 14, \\ 2x + 3y - 4z = -16, \\ 3x - 2y - 5z = -8. \end{cases}$

$$1.25.\begin{cases} 3x + 4y - 2z = 11, \\ 2x - y - z = 4, \\ 3x - 2y + 4z = 11. \end{cases} \qquad 1.26.\begin{cases} x + 5y - 6z = -15, \\ 3x + y + 4z = 13, \\ 2x - 3y + z = 9. \end{cases} \qquad 1.27.\begin{cases} 4x - y = -6, \\ 3x + 2y + 5z = -14, \\ x - 3y + 4z = -19. \end{cases}$$

$$1.28.\begin{cases} 5x + 2y - 4z = -16, \\ x + 3z = -6, \\ 2x - 3y + z = 9. \end{cases} \qquad 1.29.\begin{cases} x + 4y - z = -9, \\ 4x - y + 5z = -2, \\ 3y - 7z = -6. \end{cases} \qquad 1.30.\begin{cases} 7x + 4y - z = 13, \\ 3x + 2y + 3z = 3, \\ 2x - 3y + z = -10. \end{cases}$$

2. Решить однородную систему линейных алгебраических уравнений.

$$3.1.\begin{cases} x + y + z = 0, \\ 2x - 3y + 4z = 0, \\ 4x - 11y + 10z = 0. \end{cases} \qquad 3.2.\begin{cases} 3x - y + 2z = 0, \\ x + y + z = 0, \\ x + 3y + 3z = 0. \end{cases} \qquad 3.3.\begin{cases} x + 3y + 2z = 0, \\ 2x - y + 3z = 0, \\ 3x - 5y + 4z = 0. \end{cases}$$

$$3.4.\begin{cases} 4x - y + 10z = 0, \\ x + 2y - z = 0, \\ 2x - 3y + 4z = 0. \end{cases} \qquad 3.5.\begin{cases} 2x + 5y + z = 0, \\ 4x + 6y + 3z = 0, \\ x - y - 2z = 0. \end{cases} \qquad 3.6.\begin{cases} 3x - y - 3z = 0, \\ 2x + 3y + z = 0, \\ x + y + 3z = 0. \end{cases}$$

$$3.7.\begin{cases} x - y + 2z = 0, \\ 2x + y - 3z = 0, \\ 3x + 2z = 0. \end{cases} \qquad 3.8.\begin{cases} 2x - y - 5z = 0, \\ x + 2y - 3z = 0, \\ 5x + y + 4z = 0. \end{cases} \qquad 3.9.\begin{cases} 5x - 5y + 4z = 0, \\ 3x + y + 3z = 0, \\ x + 7y - z = 0. \end{cases}$$

$$3.10.\begin{cases} x + 3y - z = 0, \\ 2x + 5y - 2z = 0, \\ x + y + 5z = 0. \end{cases} \qquad 3.11.\begin{cases} 2x + y + 3z = 0, \\ 3x - y + 2z = 0, \\ x + 3y + 4z = 0. \end{cases} \qquad 3.12.\begin{cases} x - 2y - z = 0, \\ 2x + 3y + 2z = 0, \\ 3x - 2y + 5z = 0. \end{cases}$$

$$3.13.\begin{cases} 2x + y - z = 0, \\ 3x - 2y + 4z = 0, \\ x - 5y + 3z = 0. \end{cases} \qquad 3.14.\begin{cases} 4x + y + 3z = 0, \\ 8x - y + 7z = 0, \\ 2x + 4y - 5z = 0. \end{cases} \qquad 3.15.\begin{cases} x + 4y - 3z = 0, \\ 2x + 5y + z = 0, \\ x - 7y + 2z = 0. \end{cases}$$

$$3.16.\begin{cases} x - 2y + z = 0, \\ 3x + y + 2z = 0, \\ 2x - 3y + 5z = 0. \end{cases} \qquad 3.17.\begin{cases} x + 2y + 3z = 0, \\ 2x - y - z = 0, \\ 3x + 3y + 2z = 0. \end{cases} \qquad 3.18.\begin{cases} 3x + 2y = 0, \\ x - y + 2z = 0, \\ 4x - 2y + 5z = 0. \end{cases}$$

$$3.19.\begin{cases} 2x - y + 3z = 0, \\ x + 2y - 5z = 0, \\ 3x + y + z = 0. \end{cases} \qquad 3.20.\begin{cases} 3x + 2y - z = 0, \\ 2x - y + 3z = 0, \\ 4x + 3y + 4z = 0. \end{cases} \qquad 3.21.\begin{cases} x - 3y - 4z = 0, \\ 5x - 8y - 2z = 0, \\ 2x + y - z = 0. \end{cases}$$

$$3.22.\begin{cases} 3x + 5y - z = 0, \\ 2x + 4y - 3z = 0, \\ x - 3y + z = 0. \end{cases} \qquad 3.23.\begin{cases} 3x - 2y + z = 0, \\ 2x - 3y + 2z = 0, \\ 4x + y - 4z = 0. \end{cases} \qquad 3.24.\begin{cases} 7x + y - 3z = 0, \\ 3x - 2y + 3z = 0, \\ x - y + 2z = 0. \end{cases}$$

$$3.25.\begin{cases} x + 2y - 4z = 0, \\ 2x - y - 3z = 0, \\ x + 3y + z = 0. \end{cases} \qquad 3.26.\begin{cases} 7x - 6y + z = 0, \\ 4x + 5y = 0, \\ x - 2y + 3z = 0. \end{cases} \qquad 3.27.\begin{cases} 5x - 4y + 2z = 0, \\ 3x - 2y = 0, \\ 4x + y - 3z = 0. \end{cases}$$

$$3.28.\begin{cases} 6x + 5y - 4z = 0, \\ x + y - z = 0, \\ 3x + 4y + 3z = 0. \end{cases} \qquad 3.29.\begin{cases} 8x + y - 3z = 0, \\ x - +5y + z = 0, \\ 4x - 7y + 2z = 0. \end{cases} \qquad 3.30.\begin{cases} x + 7y - 3z = 0, \\ 3x - 5y + z = 0, \\ 3x + 4y - 2z = 0. \end{cases}$$