Assignment

LESSON 1: Gauss in Das Haus

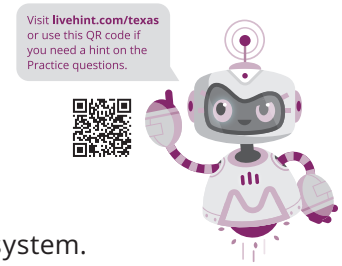
Write

Define Gaussian elimination in your own words.

Remember

A system of equations can be solved graphically or algebraically. When solving a system of three linear equations algebraically, you can use substitution or Gaussian elimination.

Practice



1. Happy's Hamburgers is analyzing their revenue and their expenses. The chief financial officer has determined that their revenue is modeled by $y = 2.44x - \frac{x^2}{20{,}000} - 5000$ and their expenses are modeled by $y = 5000 + 0.56x$, where x represents the number of hamburgers sold.
   a. Use substitution to write a new equation that can be used to solve the system.
   b. Use the Quadratic Formula to solve the resulting equation for x. Round your answer to the nearest whole number and explain why it makes sense to do so.
   c. Calculate the corresponding value(s) for y. Determine the solution(s) to the system of equations.
   d. Interpret the results.
2. You are helping a friend with her flower garden. She decides to add some clematis vines, rose bushes, and peony plants to her garden. The price of a clematis vine is \$3 more than twice a peony plant. The price of a rose bush is \$5 more than a clematis vine. She decides to buy 3 clematis plants, 4 rose bushes and 2 peony plants for a total of \$233.
   a. Write a system of three linear equations in three variables to represent this situation. Define your variables.
   b. Calculate the price of each item. Use substitution to solve the system of three linear equations in three variables.

Stretch

1. John has 15 bills in his wallet that total \$145. He has a mix of five-dollar bills, ten-dollar bills, and twenty-dollar bills. The number of ten-dollar bills is one less than twice the number of twenty-dollar bills.
   a. Write a system of three linear equations in three variables to represent this situation. Be sure to define your variables.
   b. How many of each denomination does John have in his wallet? Solve this system using Gaussian elimination.

Review

Solve each equation.

1. $\frac{1}{2}x - 3 = -4$
2. $\frac{9}{x+5} = 32$
3. $6.5 = 0.86x - (-2)$
4. $\frac{x}{2} - \frac{x}{4} = 36$