§3-1 Using Graphs and Tables to Solve Linear Equations

System of equations –

Linear system –

Verifying Solutions of Linear Systems

Use substitution to determine if the given ordered pair is an element of the solution set for the system of equations.

1a. (4,3); $\begin{cases} x + 2y = 10 \\ 3x - y = 9 \end{cases}$

1b. (5,3); $\begin{cases} 6x - 7y = 1 \\ 3x + 7y = 5 \end{cases}$

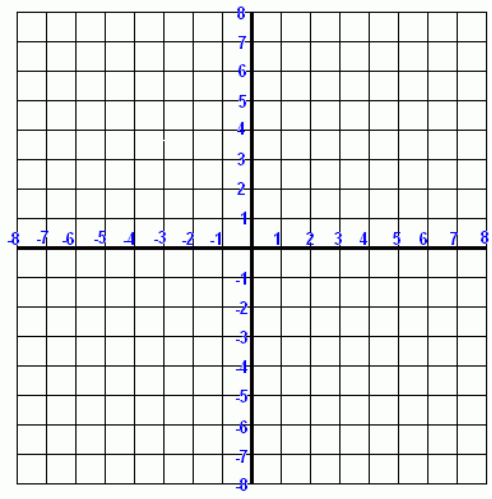
Solving Linear Systems by Using Graphs and Tables

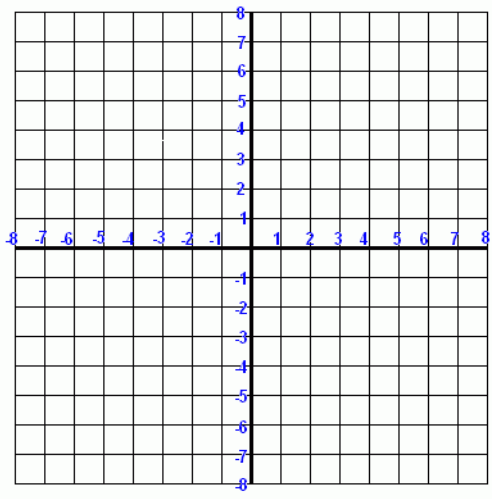
Use a graph and a table to solve each system. Check your answer.

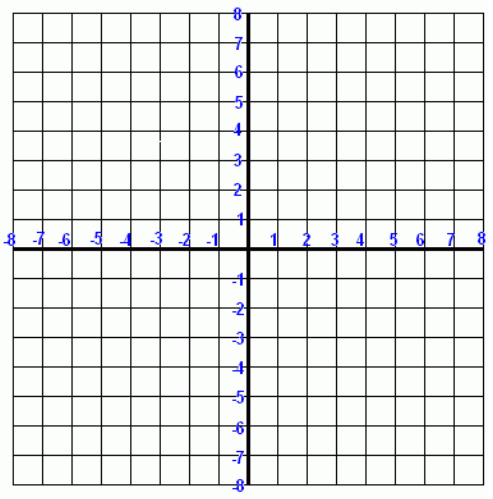
2a. $\begin{cases} 2y + 6 = x \\ 4x = 3 + y \end{cases}$

2b. $\begin{cases} x + y = 8 \\ 2x - y = 4 \end{cases}$

2c. $\begin{cases} y - x = 5 \\ 3x + y = 1 \end{cases}$





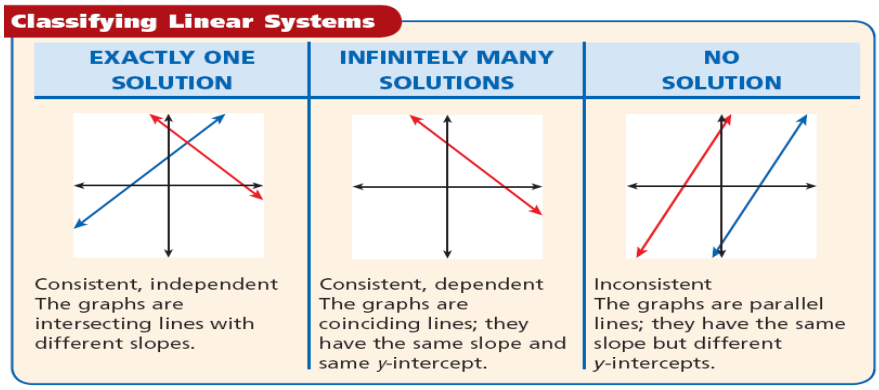


Consistent system –

Inconsistent system –

Independent system –

Dependent system –

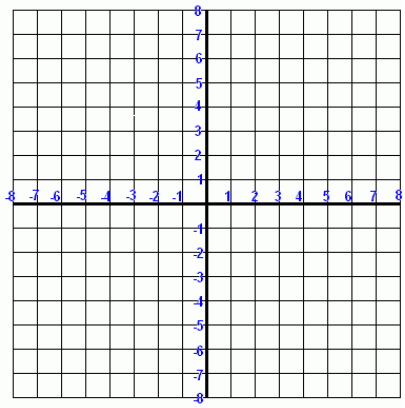


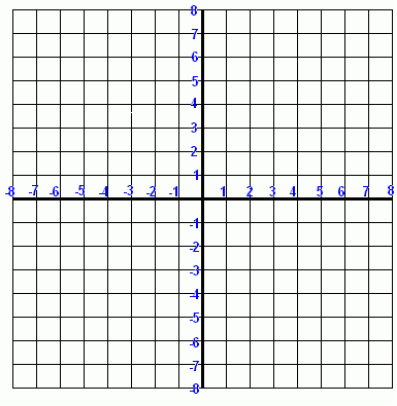
Classifying Linear Systems

Classify each system and determine the number of solutions.

3a. $\begin{cases} 7x - y = -11 \\ 3y = 21x + 33 \end{cases}$

3b. $\begin{cases} x + 4 = y \\ 5y = 5x + 35 \end{cases}$





4. Ravi is comparing the costs of long distance calling cards. To use card A, it costs \$0.50 to connect and then \$0.05 per minute. To use card B, it costs \$0.20 to connect and then \$0.08 per minute. For what number of minutes does it cost the same amount to use each card for a single call?

The term *pencil* can be used to describe the set of all lines that pass through a given point. A pencil may be composed of many consistent, independent linear systems.

§3-2 Using Algebraic Methods to Solve Linear Systems

Substitution –

Solving Linear Systems by Substitution
Use substitution to solve each system of equations.

1a. $\begin{cases} y = 2x - 1 \\ 3x + 2y = 26 \end{cases}$

1b. $\begin{cases} 5x + 6y = -9 \\ 2x - 2 = -y \end{cases}$

Elimination –

Solving Linear Systems by Elimination
Use elimination to solve each system of equations.

2a. $\begin{cases} 4x - 7y = -25 \\ -12x - 7y = 19 \end{cases}$

2b. $\begin{cases} 5x - 3y = 42 \\ 8x + 5y = 28 \end{cases}$

Classifying Systems with Infinitely Many or No Solutions

Classify the system and determine the number of solutions.

3a. $\begin{cases} 56x + 8y = -32 \\ 7x + y = -4 \end{cases}$

3b. $\begin{cases} 6x + 3y = -12 \\ 2x + y = -6 \end{cases}$

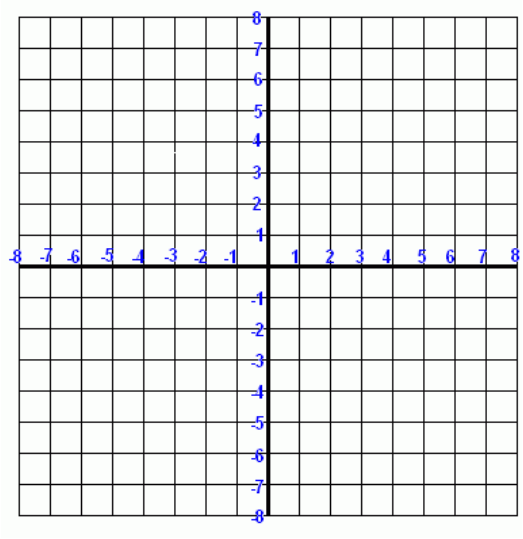
4. A coffee blend contains Sumatra beans, which cost \$5/lb, and Kona beans, which cost \$13/lb. If the blend costs \$10/lb, how much of each type of coffee is in 50lbs of the blend?

§3-3 Solving Systems of Linear Inequalities

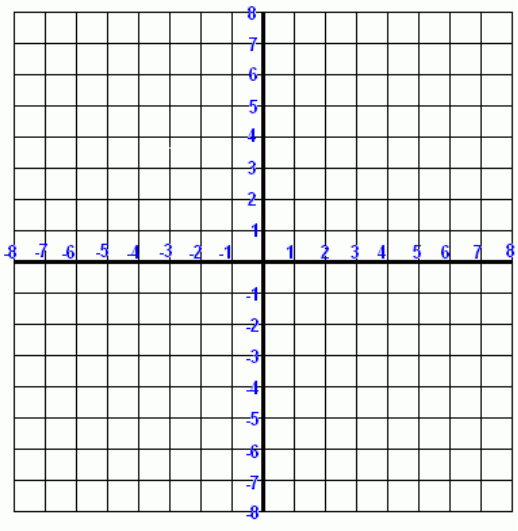
System of linear inequalities –

Graphing Systems of Inequalities
Graph each system of inequalities

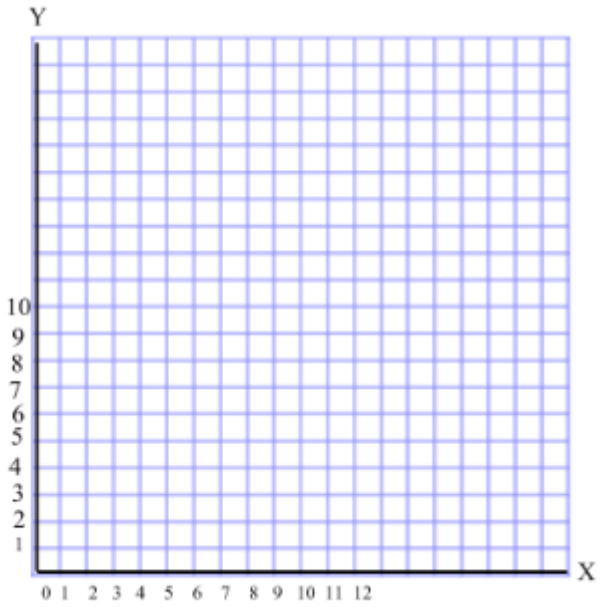
1a. $\begin{cases} x - 3y < 6 \\ 2x - y > 1.5 \end{cases}$



1b. $\begin{cases} y \leq 4 \\ 2x + y < 1 \end{cases}$

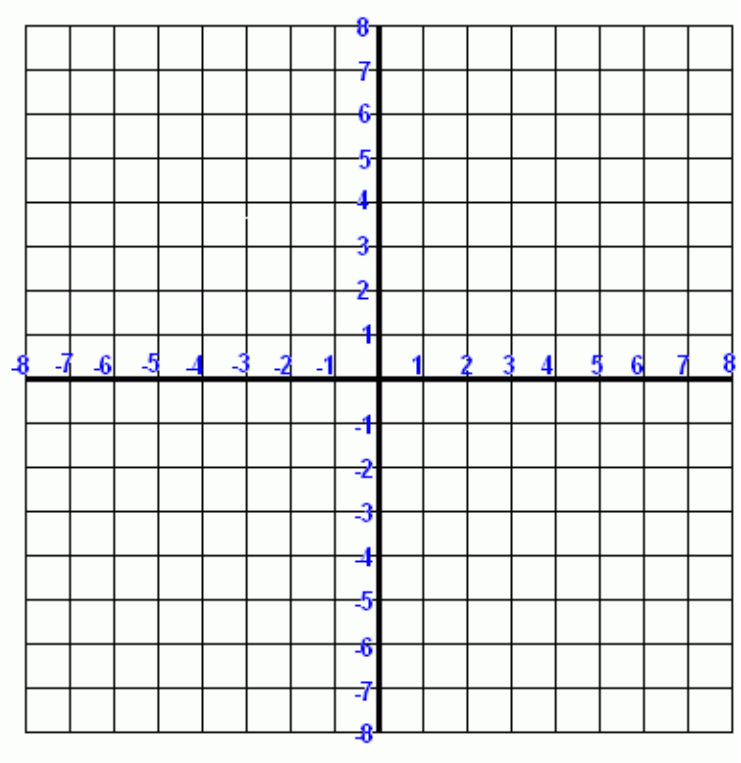


2. Leyla is selling hot dogs and spicy sausages at the fair. She has only 40 buns, so she can sell no more than a total of 40 hot dogs and spicy sausages. Each hot dog sells for $2, and each sausage sells for $2.50. Leyla needs at least $90 in sales to meet her goal. Write and graph a system of inequalities that models this situation.

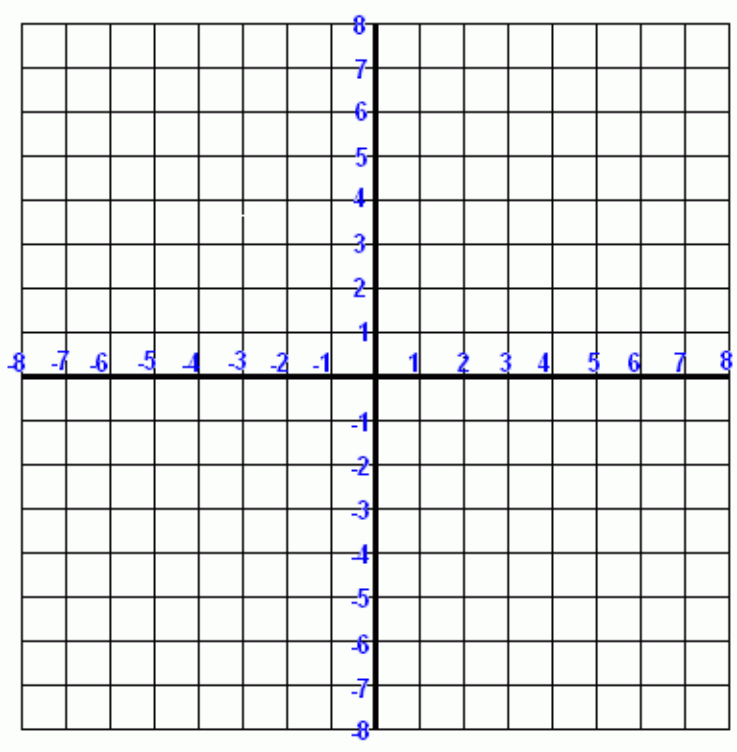


Graph the system of inequalities, and classify the figure created by the solution region.

3a. $\begin{cases} x \leq 6 \\ y \leq \frac{1}{2}x + 1 \\ y \geq -2x + 4 \end{cases}$



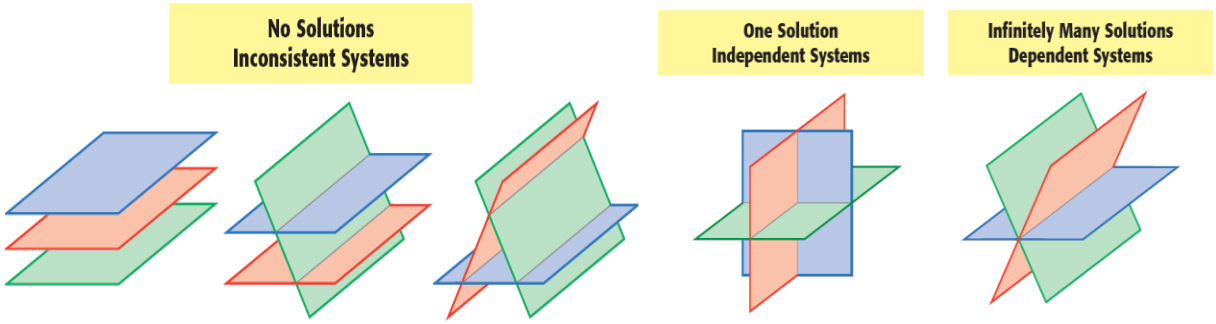
3b. $\begin{cases} y \leq 4 \\ y \geq -1 \\ y \leq -x + 8 \\ y \leq 2x + 2 \end{cases}$



Q: Why didn't the chicken cross the other side of the inequality?

A: It couldn't get past the boundary line.

§3-6 Solving Linear Systems in Three Variables



Solving a Linear System in Three Variables
Use elimination to solve the following system of equations

1. $\begin{cases} -x + y + 2z = 7 \\ 2x + 3y + z = 1 \\ -3x - 4y + z = 4 \end{cases}$

2. Jada's chili won first prize at the winter fair. The table shows the results of the voting. How many points are first-, second-, and third-place votes worth?

Winter Fair Chili Cook-off

Name	1st Place	2nd Place	3rd Place	Total Points
Jada	3	1	4	15
Maria	2	4	0	14
Al	2	2	3	13

Classifying Systems with Infinitely Many Solutions or No Solution
Classify the system, and determine the number of solutions.

3a. $\begin{cases} 3x - y + 2z = 4 \\ 2x - y + 3z = 7 \\ -9x + 3y - 6z = -12 \end{cases}$

3b. $\begin{cases} 2x - y + 3z = 6 \\ 2x - 4y + 6z = 10 \\ y - z = -2 \end{cases}$