

Systems of Linear Equations; Solving Systems Graphically

Examples:

1. Is the ordered pair $(-6, 3)$ a solution of the system of equations?

$$5x - 2y = -36$$

$$-x + 7y = 27$$

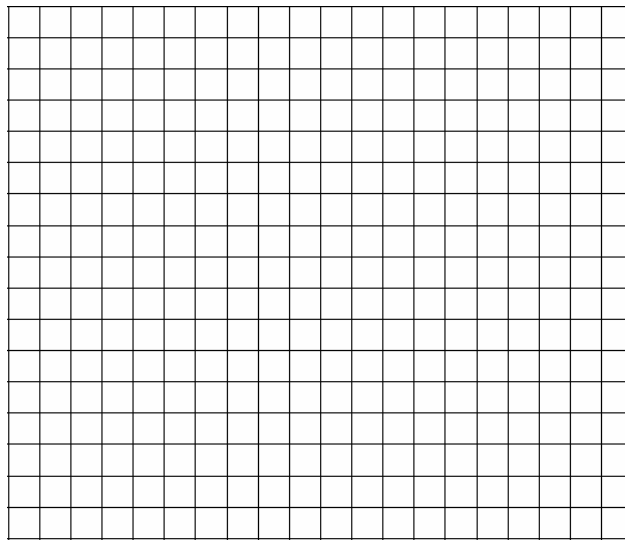
2. Is $(-5, -1)$ a solution of the following system of equations?

$$Y = 2x + 9$$

$$Y = 14 - 3x$$

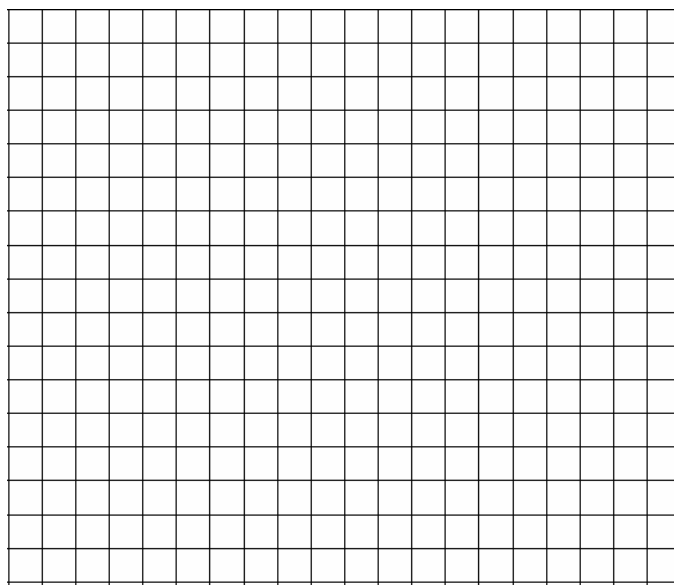
3. Solve the following system using graphing.

$$\begin{cases} y = 2x - 1 \\ y = -x - 4 \end{cases}$$



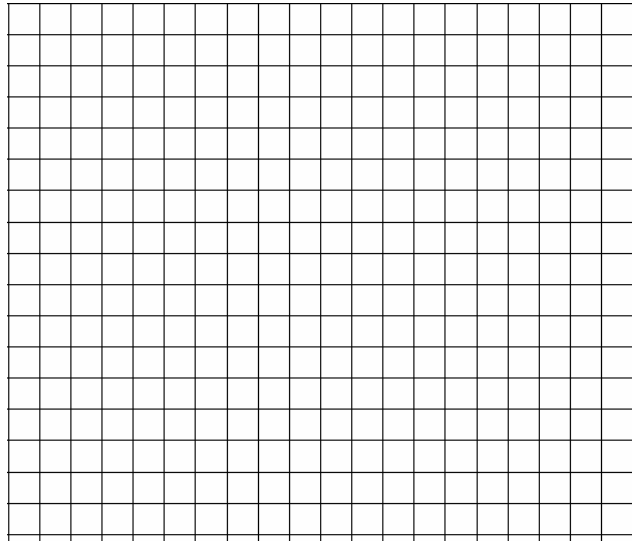
4. Solve the following system using graphing.

$$\begin{cases} y = -4x + 6 \\ 2y + 8x = -4 \end{cases}$$



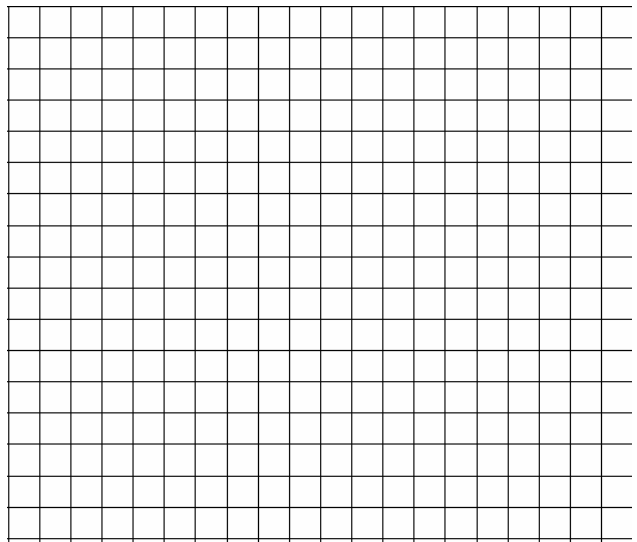
5. Solve the following system using graphing

$$\begin{cases} x + 5y = 5 \\ x - y = -7 \end{cases}$$



6. Solve the following system using graphing.

$$\begin{cases} 4x + 6y = 12 \\ y = \frac{-2}{3}x + 2 \end{cases}$$



Homework: pg. 248 #7,9,13,15,17,19,21,23,25,27,31,33

The Substitution Method for Solving Systems of Equations

Examples:

Solve using substitution.

1.
$$\begin{cases} y = x - 3 \\ 7x - 4y = 27 \end{cases}$$

2.
$$\begin{cases} x - y = -4 \\ 3x + 5y = 36 \end{cases}$$

$$3. \begin{cases} -2x + y = 3 \\ 8x - 4y = 10 \end{cases}$$

$$4. \begin{cases} 5x - 3y = 17 \\ 2x + 4y = -14 \end{cases}$$

5.
$$\begin{cases} x - 6y = 4 \\ 3x - 18y = 12 \end{cases}$$

6. A small business owner bought 15 new computers. He paid \$700 for each desktop and \$1000 for each laptop. If he paid \$11,700 total, how many desktops and laptops did he buy?

Homework: pg. 257 #5,7,9,11,17,19,21,23,25,31,33

Solving Systems of Equations by the Addition Method

Examples:

Solve using addition.

1.
$$\begin{cases} 4x + 3y = 31 \\ -4x + 5y = -23 \end{cases}$$

2.
$$\begin{cases} 2x - 9y = 33 \\ 4x + 3y = 3 \end{cases}$$

$$3. \begin{cases} 3x + 2y = -26 \\ 5y = 2x + 11 \end{cases}$$

$$4. \begin{cases} 2x - 3y = 12 \\ -4x + 6y = -24 \end{cases}$$

5.
$$\begin{cases} 3x = 4y + 11 \\ 9x - 12y = 30 \end{cases}$$

6. Erica has \$5.35 in change in her pocket. She only has nickels and dimes. If Erica has 75 coins in her pocket, how many nickels and dimes does she have?

Homework: pg. 269 #5,7,9,11,13,15,17,21,25,29,31,41,43

Applications of Systems of Equations

1. Chris has \$40 more in his wallet than Kenny. If they have \$310 total, how much money is in Kenny's wallet?

2. At Midlands Technical College, there are 68 instructors who either teach math or English. There are 12 more English instructors than math instructors. How many English instructors are there?

3. On a trip to Las Vegas, Dale drove at an average speed of 70 miles per hour, except for a period when he was driving through a construction zone. In the construction zone, Dale's average speed was 40 miles per hour. If it took Dale five hours to drive 335 miles, how long was he in the construction zone?

4. Matt was driving to attend a conference in Salt Lake City, Utah. During the first day of driving, Matt averaged 72 miles per hour. On the second day, he drove at an average speed of 80 miles per hour in order to arrive before sundown. If his total driving time for the two days was 15 hours and the distance traveled was 1148 miles, what was Matt's driving time for each day?

- Annika invested \$4200 in two CDs (certificate of deposit). Some of the money was deposited in a CD that paid 5% annual interest, and the rest was deposited in a CD that paid 4% annual interest. If Annika earned \$200 in interest in the first year, how much did she invest in each CD?

6. Angela deposited a total of \$5200 in two different certificates of deposit (CDs). One CD paid 3% annual interest and the other paid 4% annual interest. At the end of one year, she had earned \$203 in interest from the two CDs. How much did Angela invest in each CD?

7. A health food store sells two varieties of mixed nuts. The first sells for \$10/pound and the other for \$8/pound. The owner wants to make a 20 pound batch that is a combination of the two varieties. If she wants to sell this new mixture for \$8.50/pound, how many pounds of each should she mix?

8. A chemist has one solution that is 60% acid and a second solution that is 50% acid. She wants to combine the solutions to make a new solution that is 54% acid. If she needs to make 400 milliliters of this new solution, how many milliliters of the two solutions should be mixed?

9. An airplane traveling with a tailwind can make a 2250 mile trip in 4.5 hours. However, traveling into the same wind would take 5 hours to fly 2250 miles. What is the speed of the plane in calm air, and what is the speed of the wind?

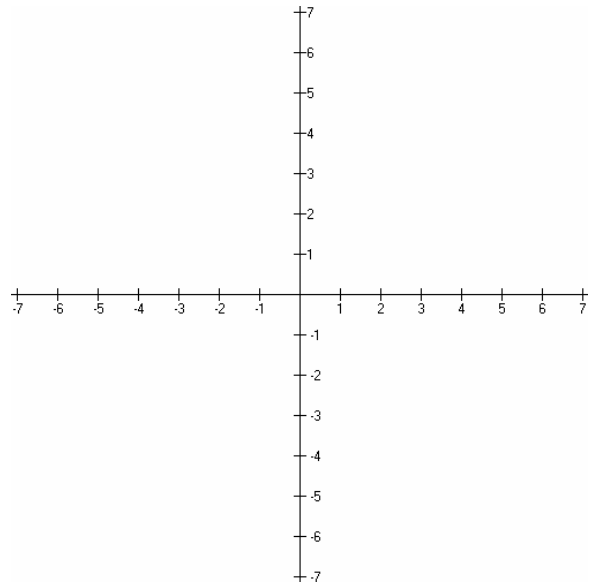
Homework: pg. 279 #5,7, 9, 17,31,33,39, 41, 43, 45, 47

Systems of Linear Inequalities

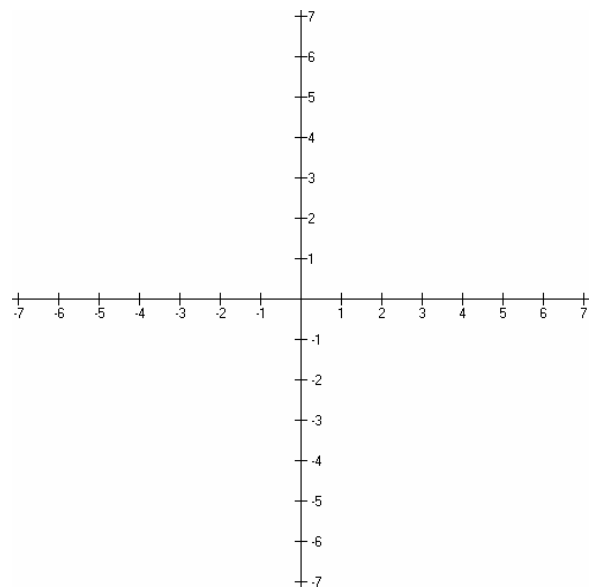
Examples:

Graph the following systems of inequalities.

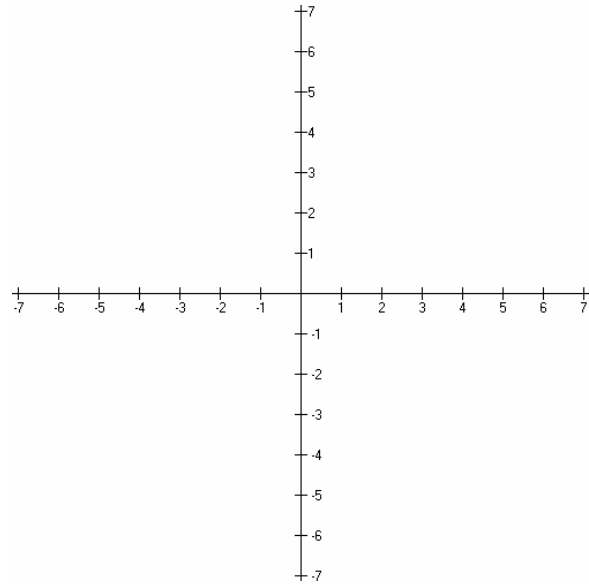
1.
$$\begin{cases} -2x + 4y \leq 8 \\ y \geq -2 \end{cases}$$



2.
$$\begin{cases} x + y < 4 \\ x \geq 1 \\ y \geq -1 \end{cases}$$



3.
$$\begin{cases} y > x + 3 \\ 2x + 3y \leq 6 \end{cases}$$



Homework: pg. 290 #5,7,9,11,13