

Algebra I
Lesson 6.1 – Solving Systems by Graphing
Mrs. Snow, Instructor

Vacation! Wouldn't it be grand to see Central Park at Christmas time? The lights, snow, ice skating, and etc... Well, the trip will cost plenty, and one way we can cut down on the bill is to compare costs of different airlines, hotels and taxi cabs. The airlines and hotels will be easy; we will pick the cheapest flight and get the cheapest hotel room. The taxi is another thing. Different companies charge different rates. Woooo! Hear that word, "rates?" That means dollars per mile and that means slope!



Big Apple Cab charges a flat rate of \$5.00 plus 30 cents per mile, while Liberty City Cab charges a flat rate of \$2.00 and 60 cents per mile. Here is where we could save some money. We will have several cab rides, from and back to the airport at 30 miles; then there will be several rides around New York City anywhere from 3 miles to 15 miles depending on the tourist sites we plan to see. Which cab is cheaper? Or should we ask which cab is cheaper for a short ride, for a long ride, and how many miles will both cost the same?

Vocabulary

System of linear equations – a set of 2 or more linear equations containing 2 or more variables

Solution of a system of linear equations – is an ordered pair that satisfies each equation in the system. The ordered pair will make all the equations true.

Consistent – systems that have at least one solution

Inconsistent – systems that have no solutions

Well, how do we find this ordered pair that is a solution to both equations? (*Hint: What is the name of this section?*)

- When given a system of equations and an ordered pair, plug in the ordered pair into both equations and see if it is a legitimate solution for each equation. You will want to get the equations into slope-intercept form.
- Each equation may be graphed. The solution to the system of equations will be the point of intersection. The actual solution then will be the x-y ordered pair that corresponds to the intersection.

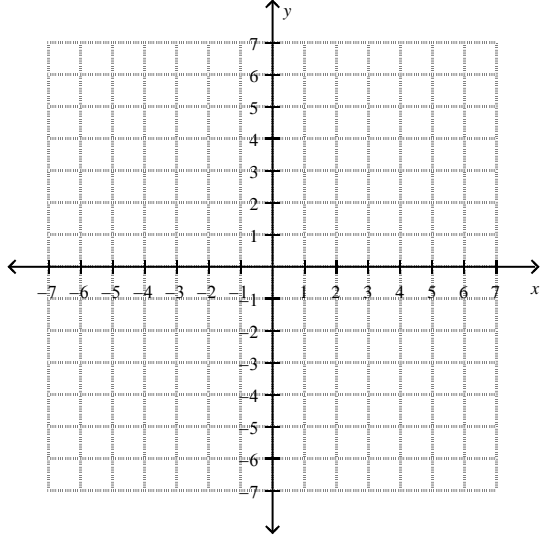
Tell whether the ordered pair is a solution to the system of equations.

$$(1, 3); \begin{cases} 2x + 5 = 5 \\ -2x + y = 1 \end{cases}$$

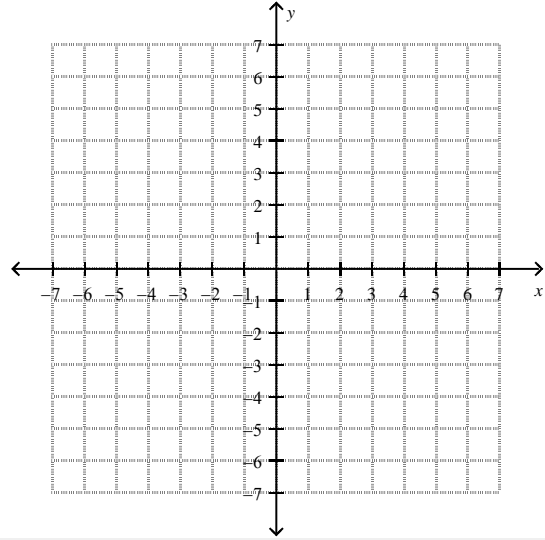
$$(2, 1); \begin{cases} x - 2y = 4 \\ 3x + y = 6 \end{cases}$$

Solve the system of equations by graphing.

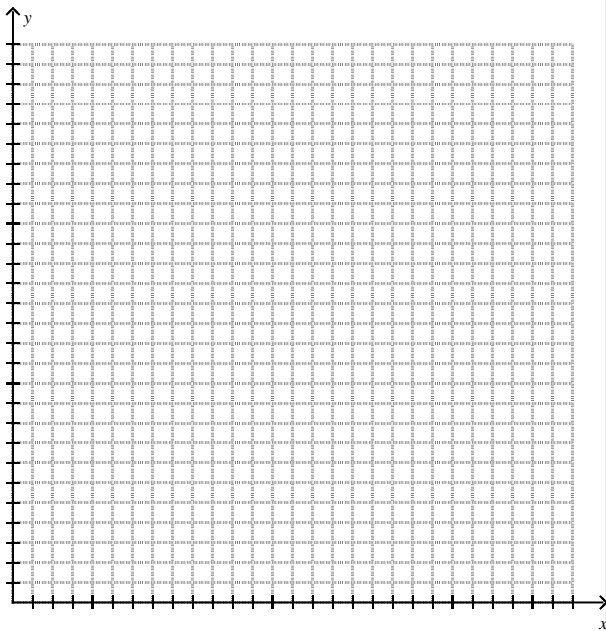
$$\begin{cases} y = -2x - 1 \\ y = x + 5 \end{cases}$$



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



Big Apple Cab charges a flat rate of \$5.00 plus 30 cents per mile. Liberty City Cab charges a flat rate of \$2.00 and 60 cents per mile. Graph and find the solution to the system of equations. Explain what the solution means. Which cab company is cheaper for short distance trips? Long distance trips?



Video club **A** charges \$10 for membership and \$3 per movie rental. Video club **B** charges \$15 for membership and \$2 per movie rental. For how many movie rentals will the cost be the same for both clubs? What is the cost? Explain what the graph means.

