

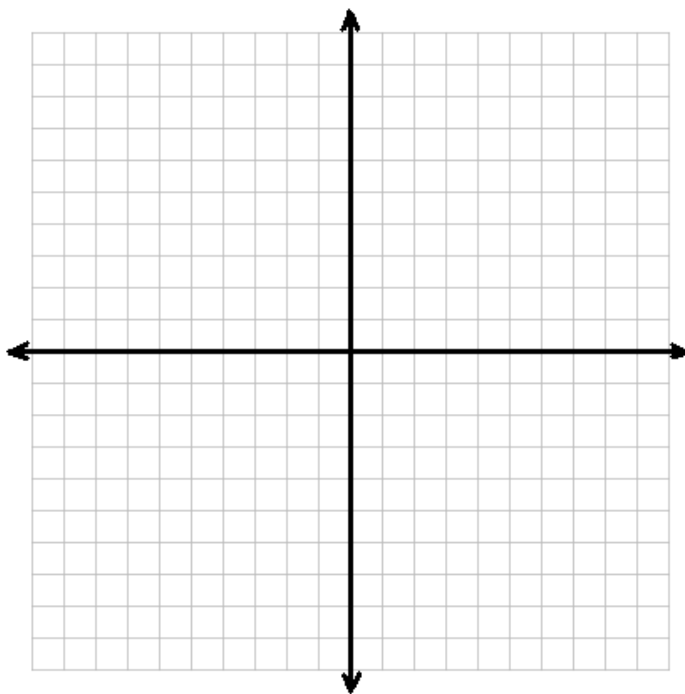
CH.5, L2 – SOLVING REAL-WORLD SYSTEMS OF EQUATIONS

GRAPHICALLY

Objective: Given a real-world situation, I will write and graph a system of equations to determine the solution and explain its contextual meaning.

Think About It: Lucy has a choice between two different streaming companies for watching movies. Company A’s cost can be represented with the function $f(x) = 2x$ where $f(x)$ is the total cost and x is the number of downloaded movies. Company B charges an initial fee of \$4 but only charges \$1 per download.

How many movies can she download so that the cost of each streaming company is the same? What is the cost? Use the graph to represent and complete the problem



System of Equations:

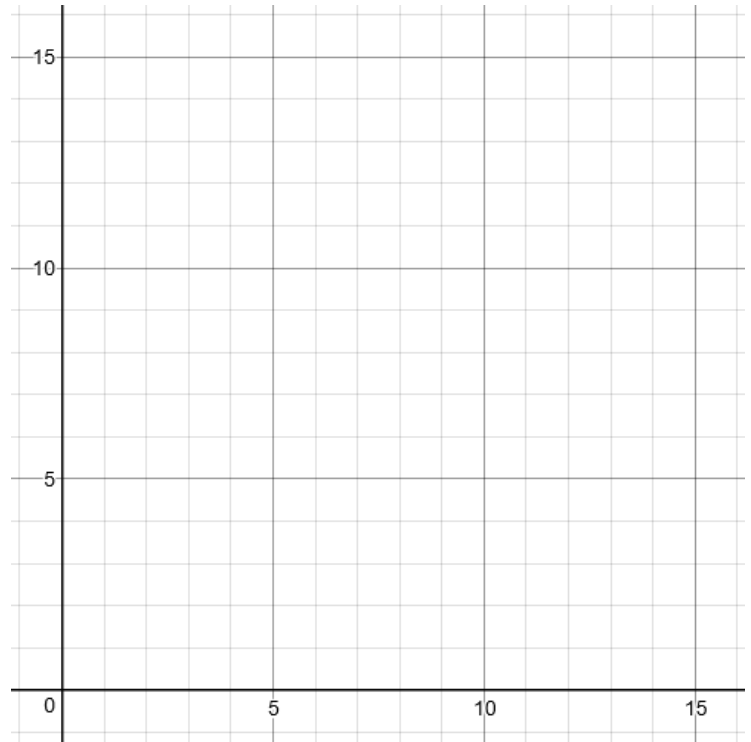
Big Idea:

- CFS:
1. Situations are annotated for key information
 2. System of equations is written and graphed
 3. Graph is properly labeled
 4. Solution is checked

Interaction with New Material:

Ex. 1) Julie is setting up a lemonade stand on a hot summer day. She plans to earn money by selling lemonade for \$1.50 per cup. She determines that after she buys lemons and sugar that it will cost her \$0.50 per cup to make the lemonade. Additionally, she bought \$4 worth of art supplies to make signs for her lemonade stand. How many cups does she need to sell in order to make a profit?

System of Equations:



Check

Julie will breakeven at ____ cups which means money _____ is _____ to money _____, \$ ____.

To make profit, she will need to sell ____ cup(s) past the _____ point.

She needs to sell ____ cup(s) to make profit.

CFS:

1. Situations are annotated for key information
2. System of equations is written and graphed
3. Graph is properly labeled
4. Solution is checked

Partner Practice:

- The graph below shows the total cost of two different cell phone companies after a certain number of minutes talking on the phone. Use the graph to answer the following questions.



Part A: Write a system of equations that represent the graph.

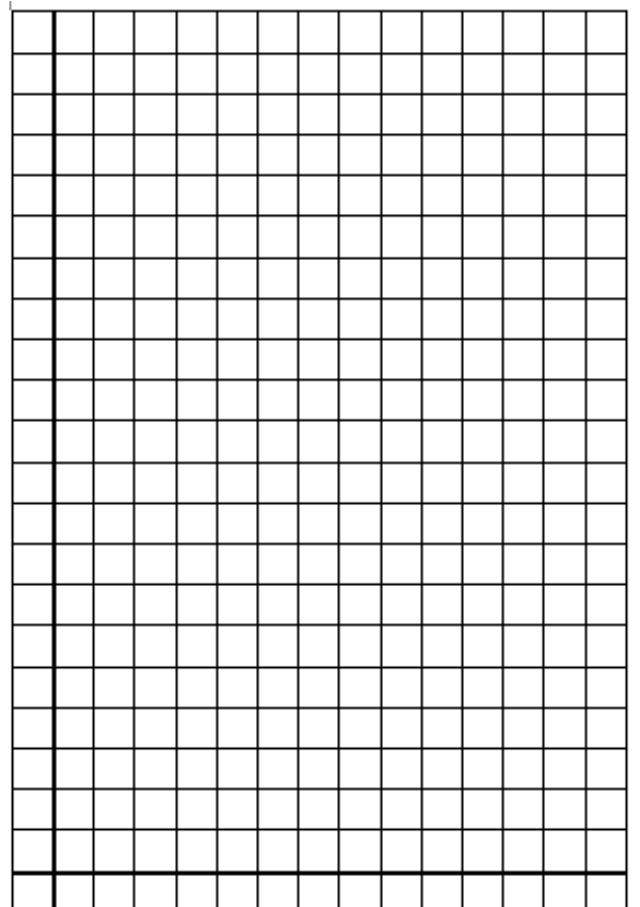
Part B: Explain what the solution to the system represents in the context of the problem.

Part C: Explain under what conditions it would be more beneficial to pick Company L or Company K.

- In the Science Olympiad, you are creating and racing cars made out of straws and buttons. Your team is in the final round competing against another school. Right now, your car has moved 5 feet, and travels at 2.5 ft/sec. The other team's car has moved 8 feet, but travels 2 ft/sec.

Step A: Write a system of equations that represents this situation.

Step B: Graph the situation and record the solution



CFS:

- Situations are annotated for key information
- System of equations is written and graphed
- Graph is properly labeled
- Solution is checked

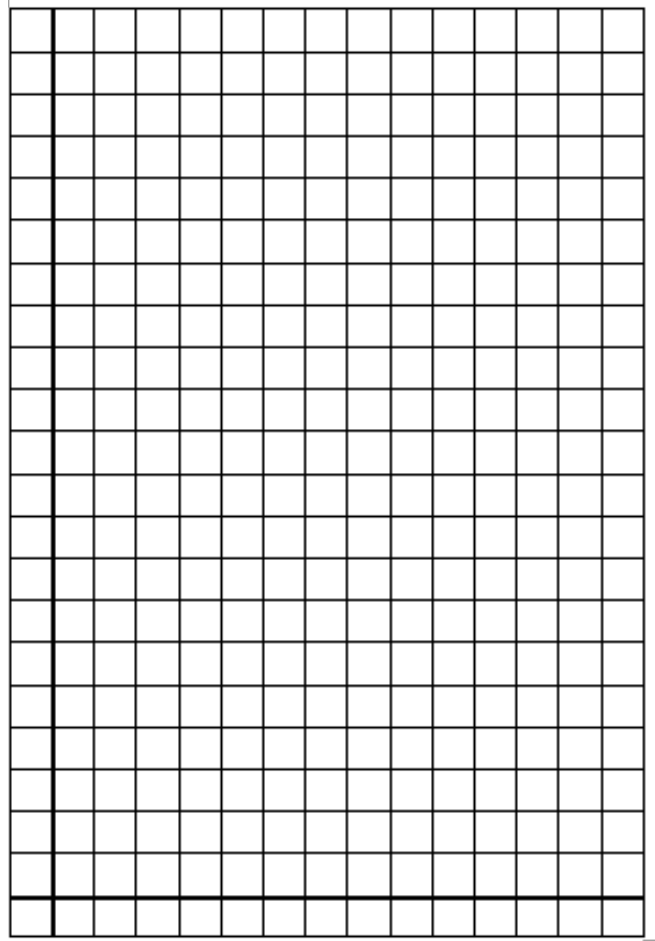
Step C: Explain what the solution represents in the context of the problem

Step D: Explain how you can use this method to determine how long it will take your car to start winning the race.

- 3. A fitness club offers two kinds of aerobics classes – a Hip-Hop dance class, and a Tap class. There are currently 6 people attending the Hip-Hop class, and attendance is increasing at a rate of 4 people per month. There are currently 10 people attending the Tap class, and attendance is increasing at a rate of 2 people per month.

Part A: Which class has more people after 1 month?
After 4 month? Explain

Part B: How many more people will be in the larger class after 6 month?



CFS:

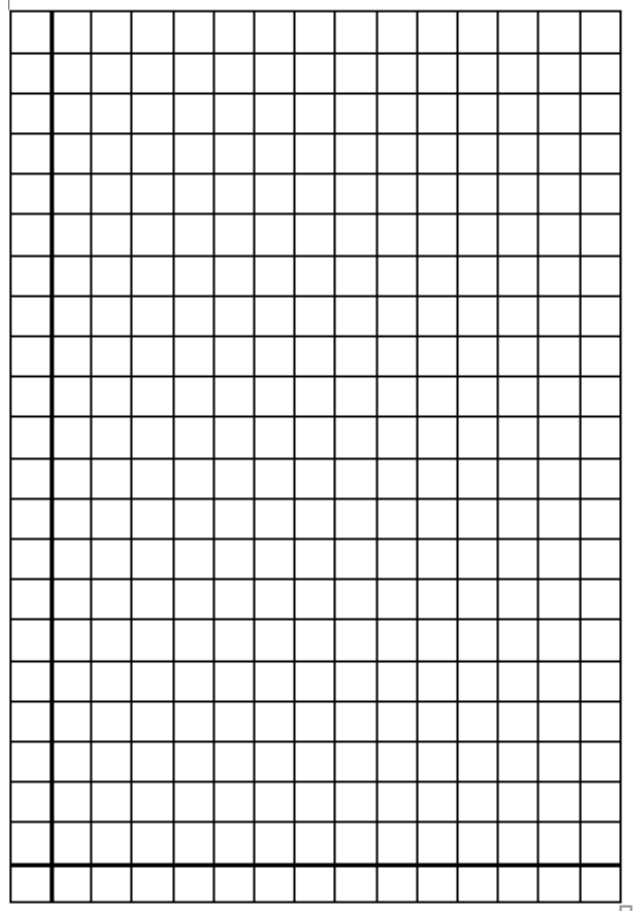
- 1. Situations are annotated for key information
- 2. System of equations is written and graphed
- 3. Graph is properly labeled
- 4. Solution is checked

4. In the fall, the math club and science club each created an Internet site. You are the webmaster for both sites. It is now January and you are comparing the number of times each site is visited each day.

Science club: There are currently 400 daily visits and the visits are increasing at a rate of 25 daily visits per month.

Math club: There are currently 200 daily visits and the visits are increasing at a rate of 50 daily visits per month.

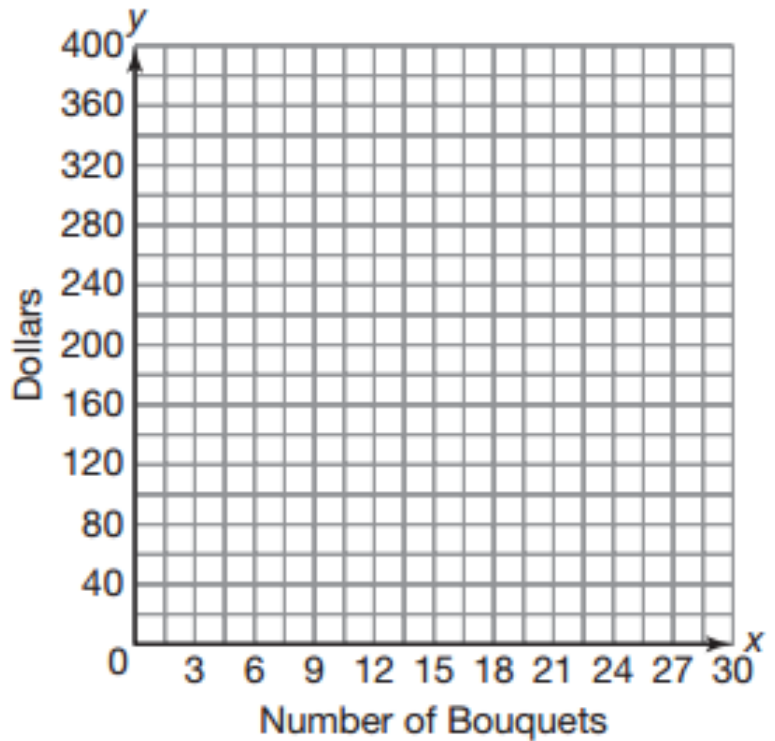
What will the date be when there are more visits to the math site? Explain how the solution to the system helped you solve.



CFS:

1. Situations are annotated for key information
2. System of equations is written and graphed
3. Graph is properly labeled
4. Solution is checked

5. Jerome sells flowers for \$12 per bouquet through his internet flower site. Each bouquet costs him \$5.70 to make. Jerome also paid a one-time fee of \$150 for an internet marketing firm to advertise his company. Approximately how many bouquets will he need to sell to make a profit?



6. Why isn't graphing an effective method of determining what the exact solution to the system in number 5? How could you determine the exact solution to the system you wrote in the previous problem?

CFS:

1. Situations are annotated for key information
2. System of equations is written and graphed
3. Graph is properly labeled
4. Solution is checked