

# Lesson 1.1.5: Two Graphing Stories

## Targets:

1. I can interpret the meaning of the point of intersection of two graphs.
2. I can graph a real life scenario and find the point of intersection.

## Warm Up

In order to be successful in this lesson, you will need to be able to graph lines and write the equation for the line. You should have learned how to do this in 8th grade. I want you to review these two skills before moving on. You can find the links on my website.

\_\_\_\_\_ Graph from Slope-Intercept Equation

\_\_\_\_\_ Slope-Intercept Equation from a Graph

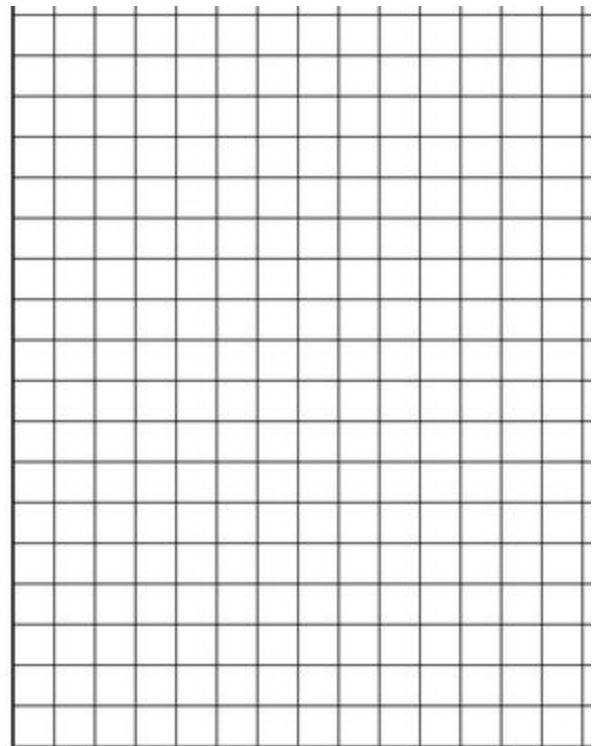
## Example 1: Graph this story

Visualize both the story and what the graph will look like as you read the situation. When you graph the story, you do not need to use exact data, but you do need to label each axis.

Consider the story:

*Maya and Earl live at opposite ends of the hallway in their apartment building. Their doors are 50 feet apart. They each start at their door and walk at a steady pace towards each other and stop when they meet.*

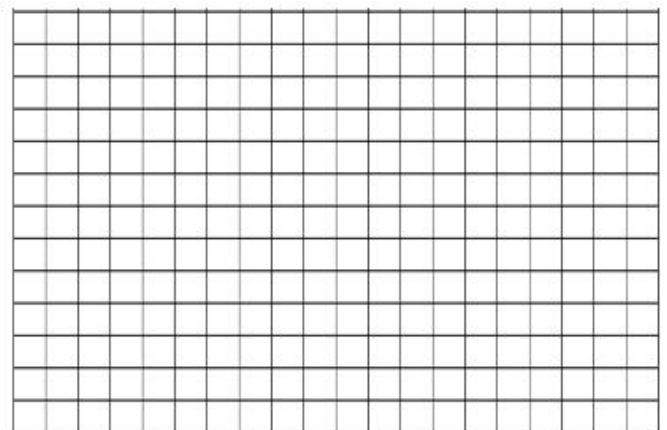
What would their graphing stories look like if we put them on the *same* graph? When the two people meet in the hallway, what would be happening on the graph? Sketch a graph that shows their distance from Maya's door.



## Example 2: Stairs

Watch the video on my website. This video shows a man and a girl walking on the same stairway. As you watch it, keep in mind you will be graphing the story soon.

1. Watch the video
2. Label the axes
3. Graph the man's elevation vs. time
4. Watch the next video to make sure you did it right
5. Graph the girl's elevation vs. time on the same graph
6. Watch the next video to make sure you did it right



### Example 3: Duke and Shirley

Read the story that follows, and keep in mind that you will represent this story with a graph.

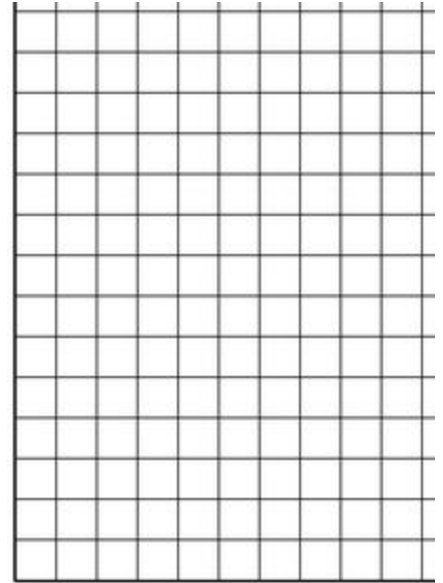
- Duke starts at the base of a ramp and walks up it at a constant rate. His elevation increases by three feet every second.
- Just as Duke starts walking up the ramp, Shirley starts at the top of the same 25 foot high ramp and begins walking down the ramp at a constant rate. Her elevation decreases two feet every second.

Sketch two graphs on the same set of elevation-versus-time axes to represent Duke's and Shirley's motions.

### Analyze the Graph

Answer the following questions about the Duke and Shirley story in your notes. Work with a partner if you would like to.

1. What are the coordinates of the point of intersection of the two graphs?
2. At what time do Duke and Shirley pass each other?
3. Write down the equation of the line that represents Duke's motion as he moves up the ramp.
4. Write down the equation of the line that represents Shirley's motion as she moves down the ramp.
5. Show that the coordinates of the point you found in the question above satisfy both equations.



### Lesson Summary

- The intersection point of the graphs of two equations is an ordered pair that is a solution to **BOTH** equations. In the context of a distance (or elevation) story, this point represents the fact that both distances (or elevations) are equal at the given time.
- Graphing stories with quantities that change at a constant rate can be represented using piece-wise linear equations.

### Exit Ticket

Here is some more specific information about Maya and Earl (from example 1).

- Maya and Earl live at opposite ends of the hallway in their apartment building. Their doors are 50 feet apart. They each start at their door and walk at a steady pace towards each other and stop when they meet.
- Maya walks at a constant rate of 3 feet every second.
- Earl walks at a constant rate of 4 feet every second.

Graph both people's distance from Maya's door versus time in seconds.

According to your graphs, approximately how far will they be from Maya's door when they meet?

