Maps to Graphs

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Summary	Students will be given two linear distance-time graphs and asked to tell a story about each graph and to compare them. They will later explore comparisons between points in each line.
Goals	1. Increase facility with the Cartesian plane. 2. Work on graph-table-narrative interconnections. 3. Begin to introduce rational numbers and the idea that a line contains an infinite number of points.
Materials	Overheads, Handouts
Keywords	Full Class Discussion Interpretation of Graphs Production of Graphs Small Group Work

Activity Plan:

1. How far? [Whole Class]

Show the overhead on page 1. Go over the table and map of Margaret's trip. Ask students to explain what parts of the maps correspond to what parts of the table.

Then ask the students to compare the map to the diagram on page 3. [Note: The former is a map; the latter is a graph.]

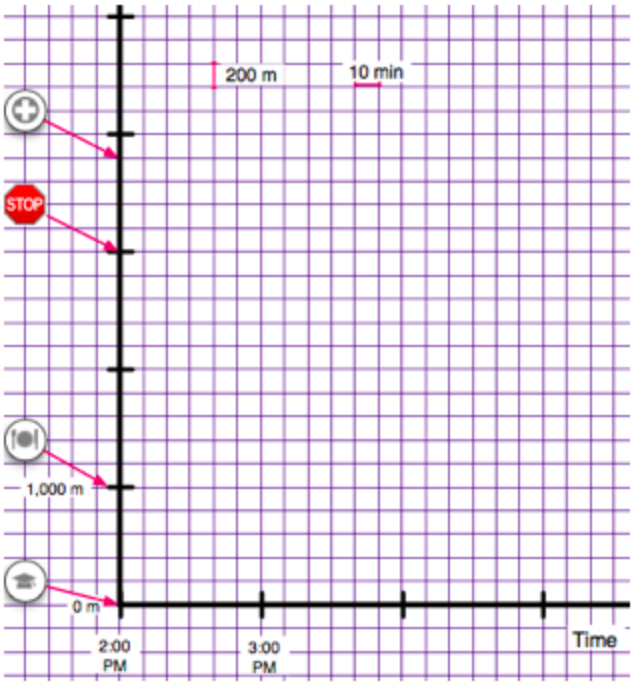
> They should take note of the fact that time is now displayed on the horizontal dimension.

Pass out the handout on page 4, so students can work along side you while you work on the overhead.

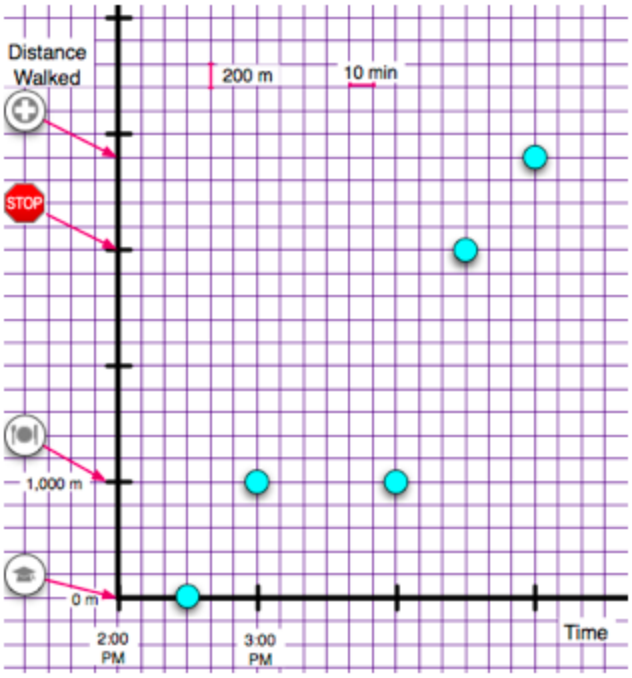
Use the overhead on page 2 to have the students reconstruct the changes in time and distance. The key is at the top of the graph on page 3 (each side of a unit represents 200 meters).

Time	D **Time**		**Place**	D **Distance**
2:30			School	
	30 min.			1000 meters
3:00			Restaurant	
	1 hr.			0 meters
4:00			Restaurant	
	30 min.			2000 meters
4:30			Stop sign	
	30 min.			800 meters
5:00			Hospital	

Have the students help name the places and times on the graph's *y*-axis and *x*-axis (respectively); they can do this on their handouts (page 4). Below we show the graphs with this information, but this information is not available to the students.



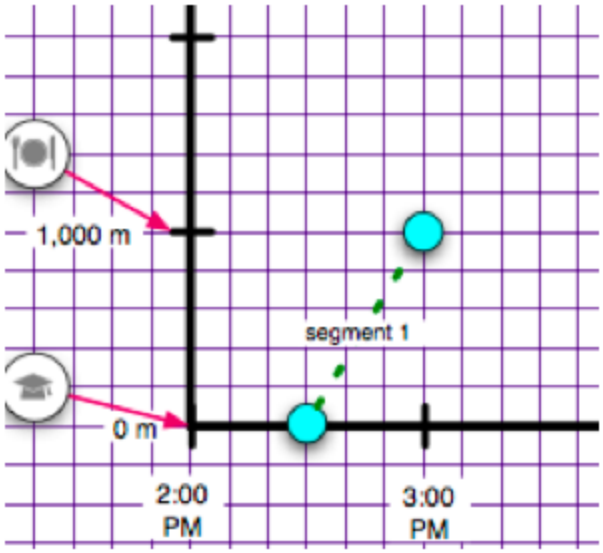
Get the students to help you locate some of the points for time and location (like the graph below) on the overhead (page 3).



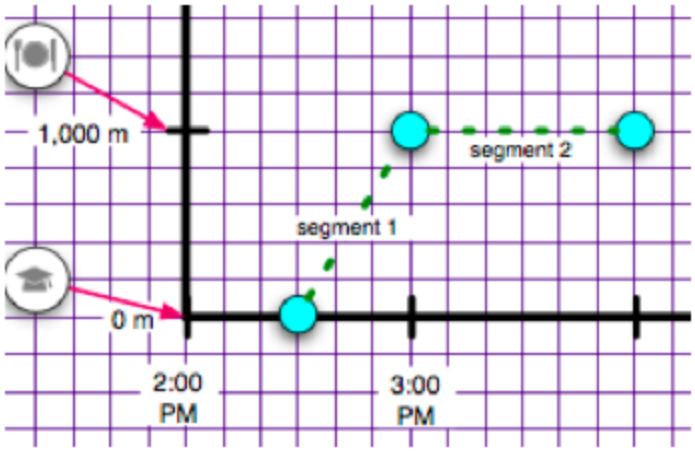
2. Reading Graphs [Group Work]

Discuss segment 1 (between the first two points) with the students using the overheads on pages 5-7. Make sure to ask:

If Margaret had continued walking at the same pace for another thirty minutes, how far would she have walked? [2 km] What does that tell you about how fast she was walking?



How fast was she walking in segment 2 (between the second and third points) of her trip [0 km per hour.]



3. Homework: The homework (page 8) is similar to the activity developed in the classroom.

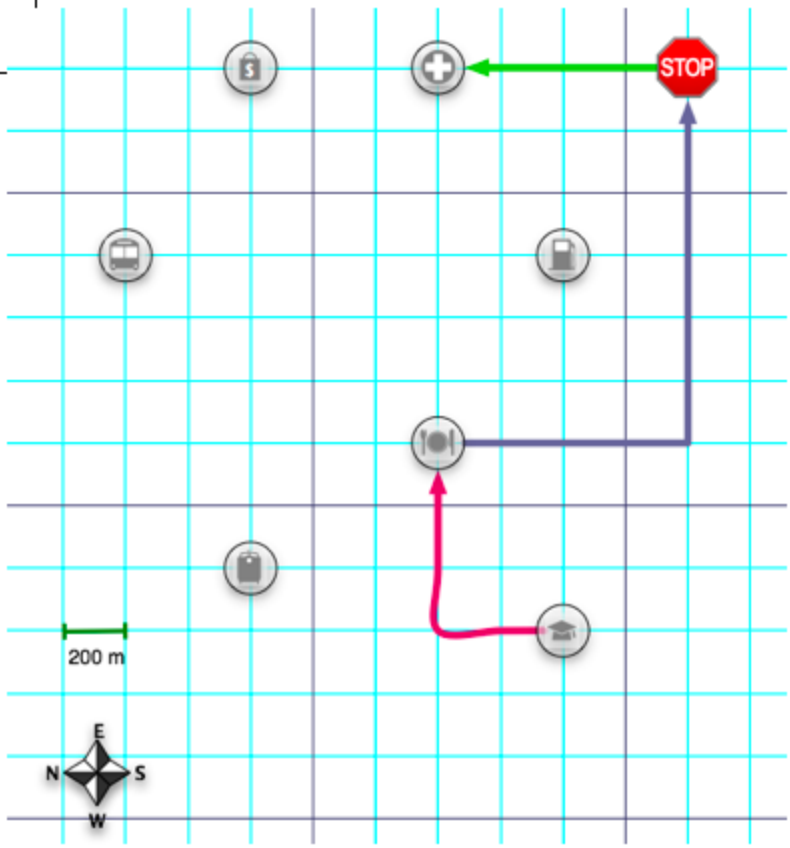
Overhead 1: Margaret's Trip (Page 1)

After school Margaret went on a trip.

Time	Event
2:30 PM	Leaves school
3:00 PM	Arrives at restaurant
4:00 PM	Leaves restaurant
4:30 PM	Arrives at stop sign
4:30 PM	Leaves stop sign
5:00 PM	Arrives at hospital

The table to the right shows where Margaret went.

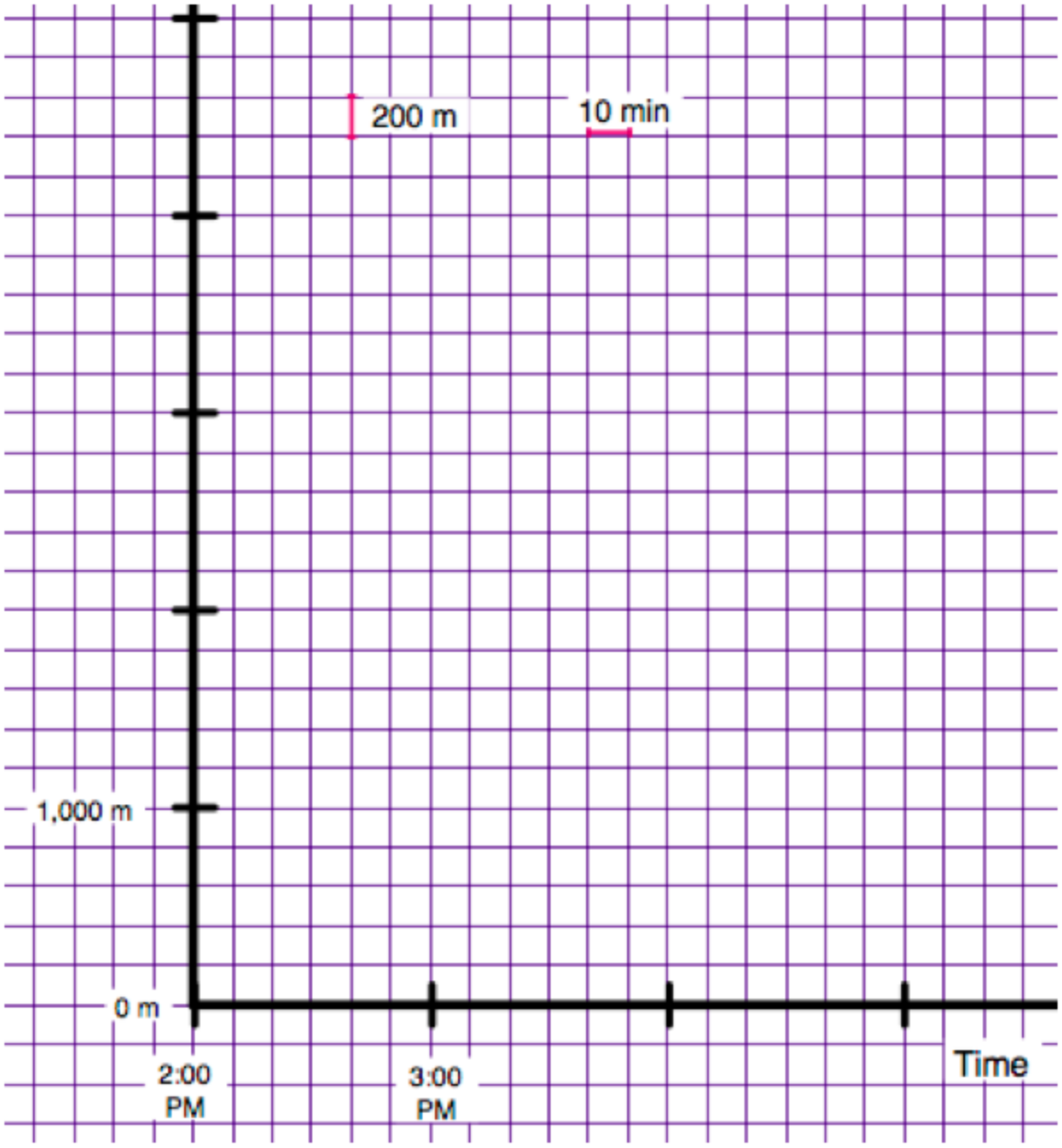
The map to the right shows Margaret's trip visually. (She has to walk on the sidewalks, so she can't walk diagonally.)



Overhead 2: Identifying the Coordinates (Page 2)

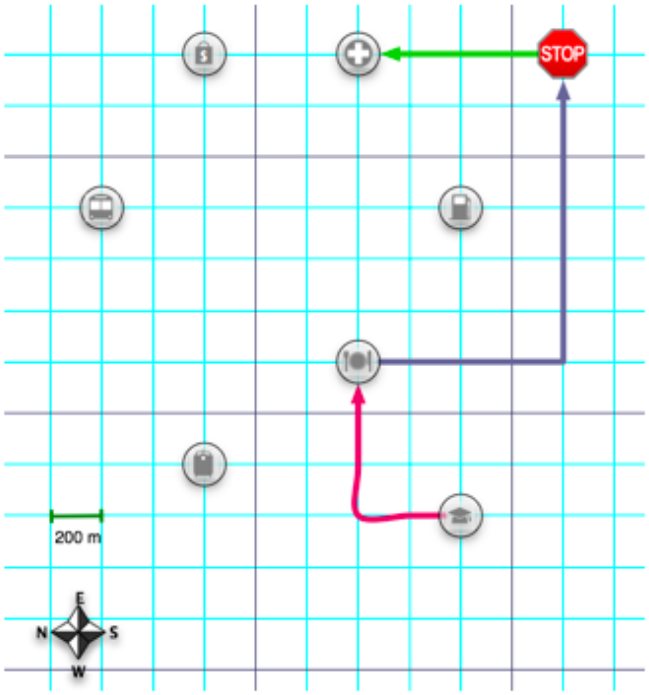
Time	D Time		Place	D Distance in meters
2:30 PM			School	
3:00 PM			Restaurant	
4:00 PM			Restaurant	
4:30 PM			Stop sign	
5:00 PM			Hospital	

Overhead 3: Margaret's Trip **(Page 3)**

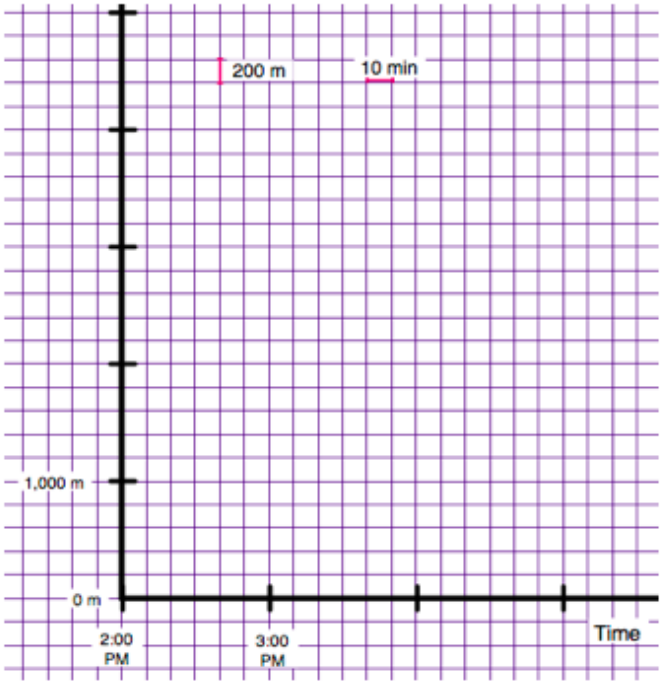


Handout: Margaret's Trip **(Page 4)**

Name: _____ Date: _____



Time	D Time		Place	D Distance
2:30			School	
3:00			Restaurant	
4:00			Restaurant	
4:30			Stop sign	
5:00			Hospital	

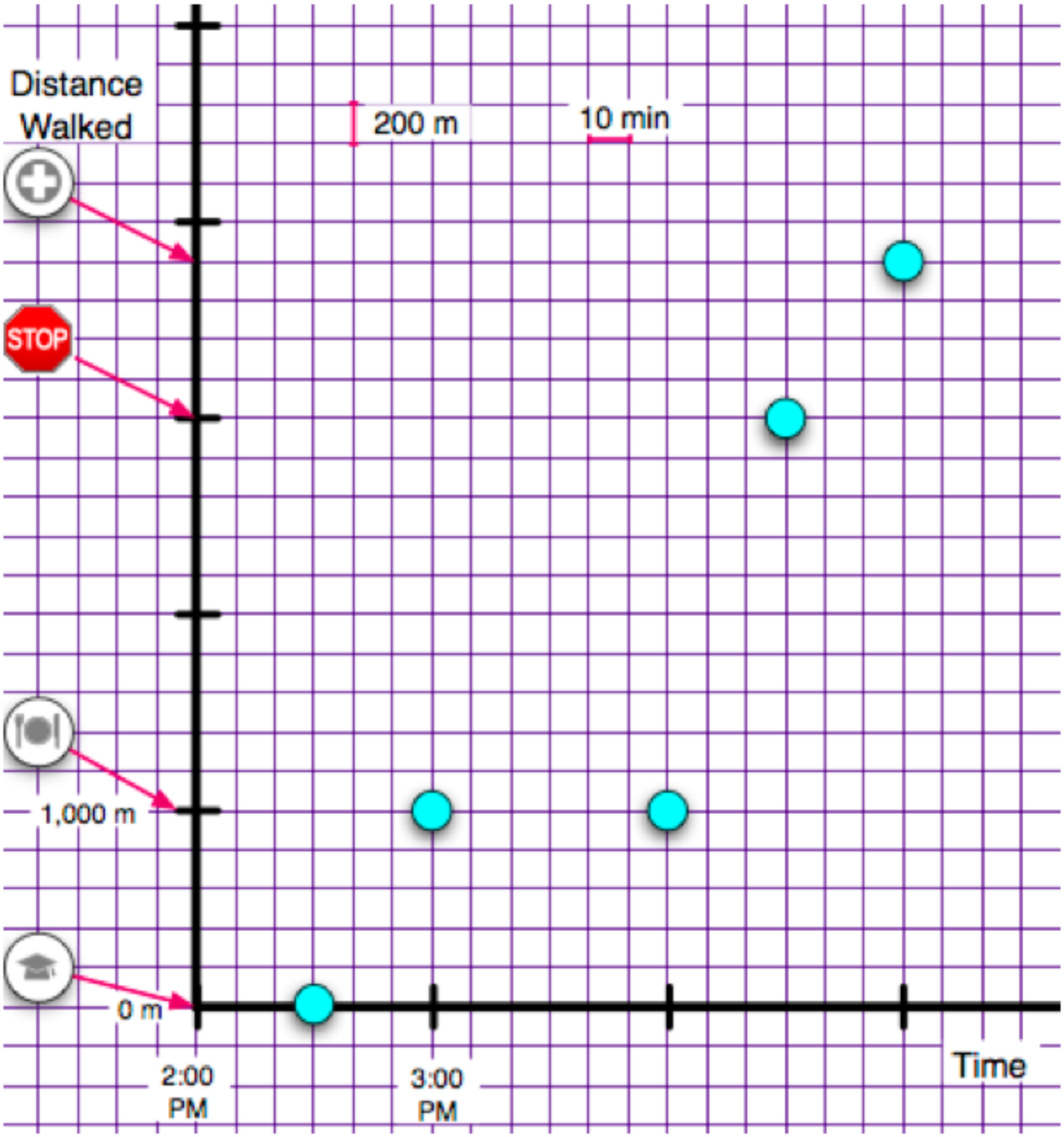


Plot points on the distance-time graph.

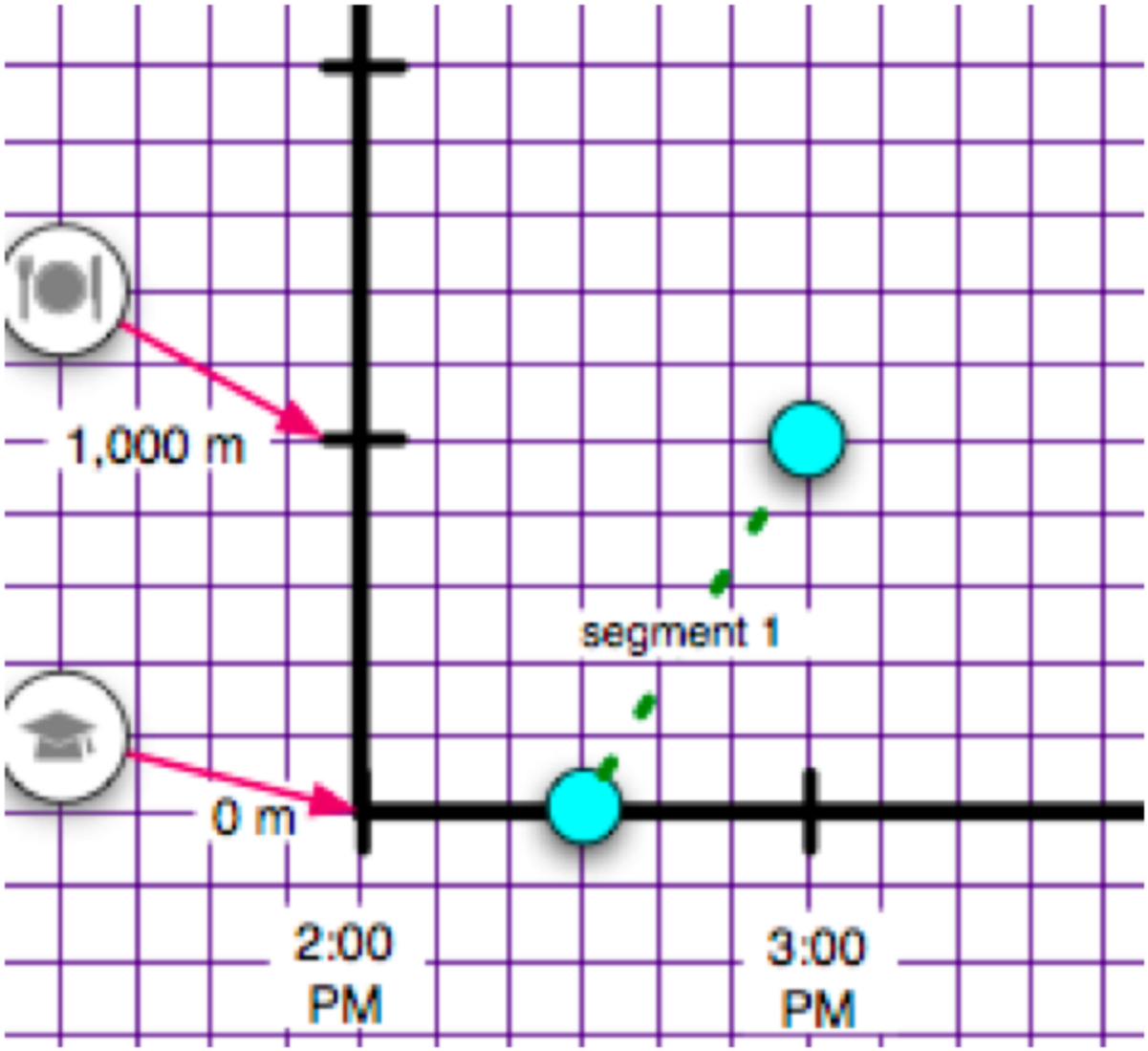
When did Margaret walk the fastest?

When did she walk the slowest?

Overhead 4: Margaret's Trip **(Page 5)**

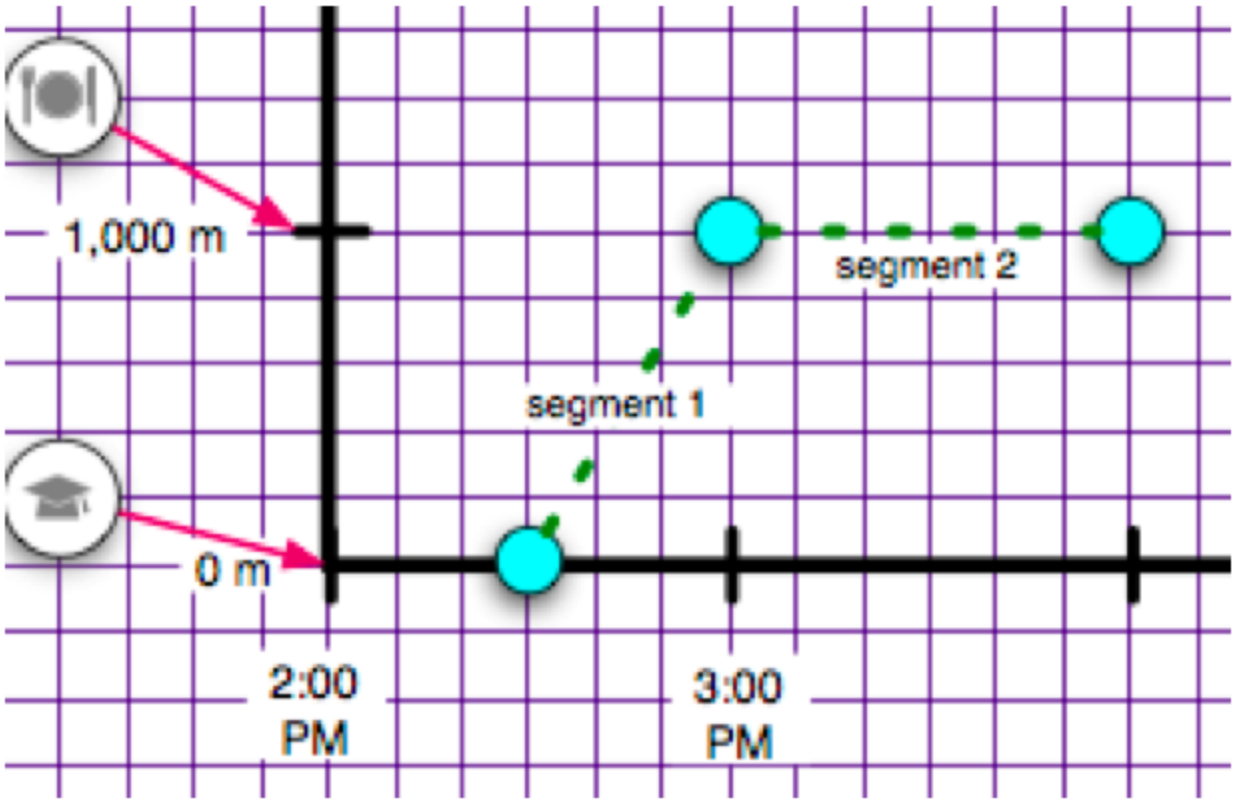


Overhead 5: Segment Discussion **(Page 6)**



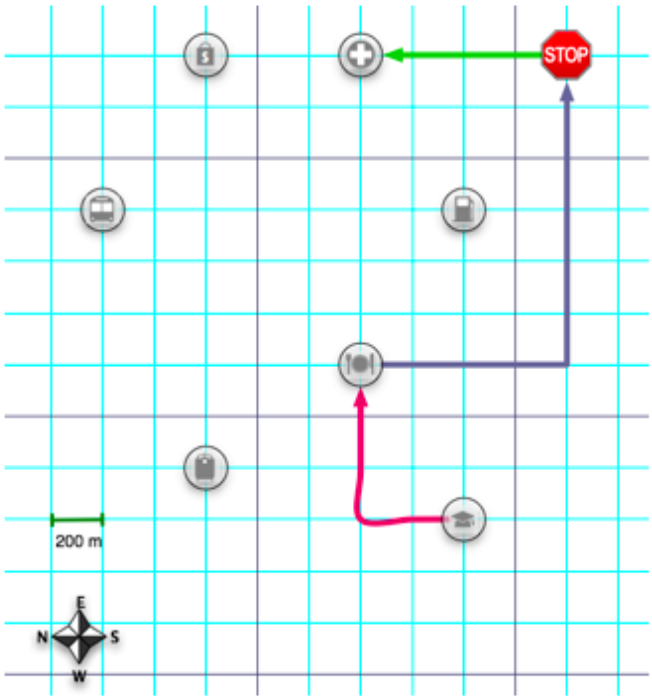
Overhead 6: Segment Discussion **(Page 7)**

How fast was she walking in segment 2 of her trip?

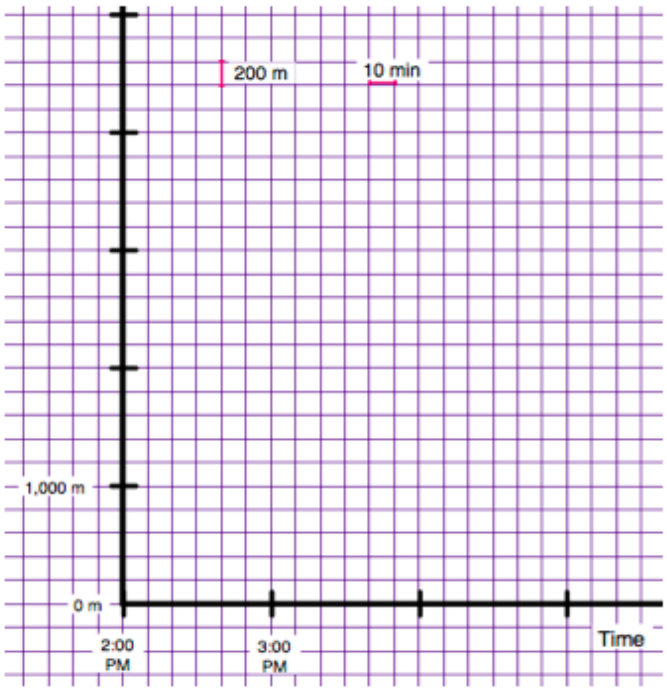


Overhead and Homework: Joe's Trip (Page 8)

Name: _____ Date: _____



Time	D Time		Place	D Distance
2:00			School	
2:30			Restaurant	
3:30			Restaurant	
4:00			Stop sign	
4:30			Hospital	



Plot points on the distance-time graph.

When did Joe walk the fastest?

When did he walk the slowest?