Name:

Directions: Read the scenario carefully and answer the following questions.

Royal Arch (6,915') is perched high along a rugged fold in the Boulder Flatirons. These rocks are remnants of the Fountain Formation, a mineral-rich sand eroded from the ancestral Rocky Mountain uplift 300 Million years ago.

You and your group have decided you are going to hike to the Royal Arch in Chautauqua Park next weekend. It is a moderate to strenuous 3.2-mile hike with a vertical gain of 1,205'. At the top, you stopped and then immediately began hiking back down the mountain.

Listed below is a table that accurately represents typical hiking speeds for this particular hike.

Distance (cumulative)	Time (cumulative)	Hiking Speed (miles per minute)
0.80 miles		0.02
1.2 miles		0.02
1.6 miles		0.02
2.0 miles		0.05
3.2 miles		0.05

1. **On your own**, fill in the missing data.

2. **In partners**, graph the distance (on the y-axis) and time (on the x-axis) on the graph provided.
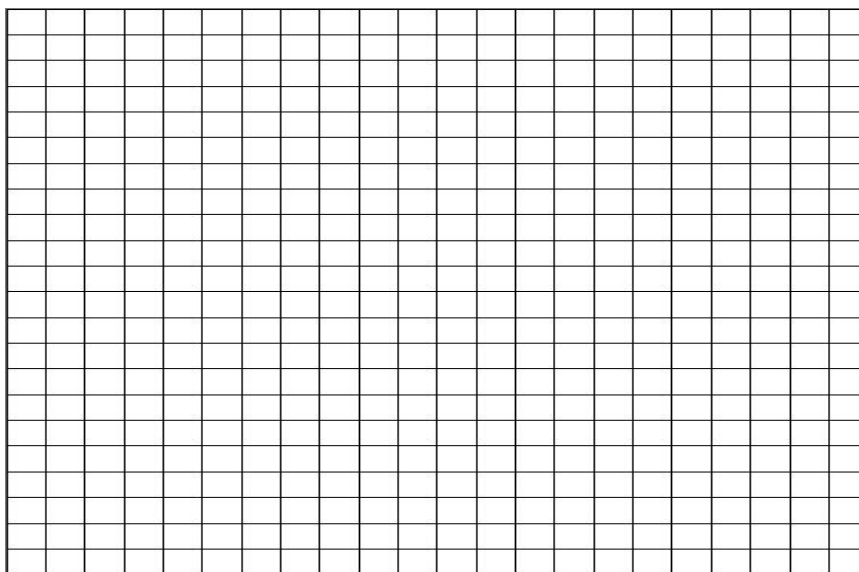
3. **In your group (questions 3-7)**:
   a. What do you notice about the graph?

4. Determine the equations for the graph.

5. What is your average hiking speed over the entire trip?

6. What the average hiking speed from 60 minutes to 75 minutes?

7. What is the range if given the domain $t \in [80,90]$? Show your calculations.

8. If the graph were based off of **distance from the starting point** of the hike, how would the graph be different? List the differences **and** graph the new functions on top of the graph above.

9. Where is the newly graphed function increasing? Decreasing? Write your response in interval notation.

Scenario: Suppose you and your group mates were exhausted from the arduous 90-degree hike and decided to take a 25-minute break at the top. What would change based on your break? What is the rate of change during the break?