

3.2 Floating Down the River

A Solidify Understanding Task

Alonzo, Maria, and Sierra were floating in inner tubes down a river, enjoying their day. Alonzo noticed that sometimes the water level was higher in some places than in others. Maria noticed there were times they seemed to be moving faster than at other times. Sierra laughed and said “Math is everywhere!” To learn more about the river, Alonzo and Maria collected data throughout the trip.

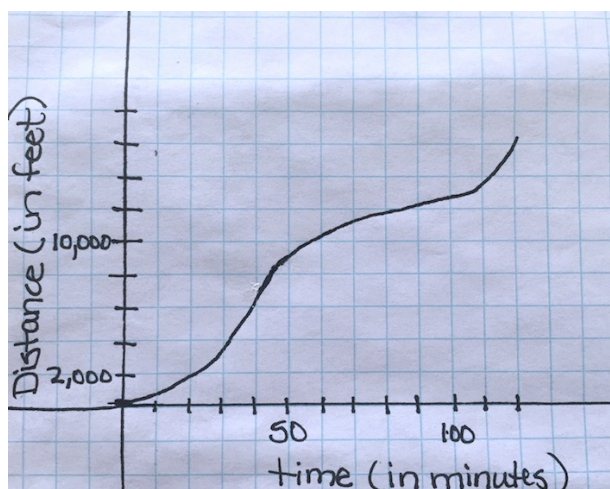


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|----------------------|---|----|----|----|----|----|----|----|----|----|-----|-----|-----|
| Time (in minutes) | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 |
| Depth (in feet) | 4 | 6 | 8 | 10 | 6 | 5 | 4 | 5 | 7 | 12 | 9 | 6.5 | 5 |

1. Use the data collected by Alonzo to interpret the key features of this relationship.

Maria created a graph by collecting data on a GPS unit that told her the distance she had traveled over a period of time.



2. Using the graph created by Maria, describe the key features (increasing, decreasing, domain, range, maximum, minimum, intercepts) of this relationship.

Part II: Interpreting data

3. Sierra looked at the data collected by her two friends and made several of her own observations. Explain why you either agree or disagree with each observation made.

- a) The depth of the water increases and decreases throughout the 120 minutes of floating down the river.
- b) The distance traveled is always increasing.
- c) The distance traveled is a function of time.
- d) The distance traveled is greatest during the last ten minutes of the trip than during any other ten minute interval of time.
- e) The domain of the distance/time graph is all real numbers.
- f) The y-intercept of the depth of water over time function is $(0,0)$.
- g) The distance traveled increases and decreases over time.
- h) The depth of the water is never 11 feet.
- i) The range of the distance/time graph is from $[0, 15000]$.
- j) The domain of the depth of water with respect to time is from $[0,120]$
- k) The range of the depth of water over time is from $[4,5]$.
- l) The distance/ time graph has no maximum value.
- m) The depth of water reached a maximum at 30 minutes.