

3.2 Floating Down the River

A Solidify Understanding Task



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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.

Dom: $x \rightarrow \text{time} \rightarrow [0, 120]$

Hint
(0,4)



Increase: (0,30)
(60,90)

Dec: (30,60)
(90,120)

Abs Max (90,12)
Rel (9,4)
Min (60,4)

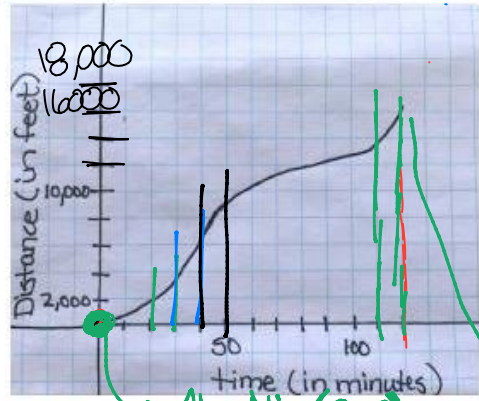
1. Use the data collected by Alonzo to interpret the key features of this relationship.

Range: $y \rightarrow \text{depth (ft)} \rightarrow [4, 12]$

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

Domain:
 $0 \leq x \leq 120$
time in mins

Range:
 $0 \leq y \leq 16000$
Distance in ft



Increase
(0,120)
X-int: (0,0)
y-int: (0,0)
Abs Max (120, 16,000)

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.

T → goes up and down

b) The distance traveled is always increasing.

T → graph always goes ↑

c) The distance traveled is a function of time.

T → pass VLT

d) The distance traveled is greatest during the last ten minutes of the trip than during any other ten minute interval of time.

T → steepest slope

e) The domain of the distance/time graph is all real numbers.

F → cannot have neg time

f) The y-intercept of the depth of water over time function is (0,0).

F → y-int (0,4)

g) The distance traveled increases and decreases over time.

F → always ↑

h) The depth of the water is never 11 feet.

F → hits 12

i) The range of the distance/time graph is from [0, 15000].

F → go to 16000

j) The domain of the depth of water with respect to time is from [0,120]

T → only go 120 mins

k) The range of the depth of water over time is from [4,5].

F → [4,12]

l) The distance/ time graph has no maximum value.

F → Abs Max @ (120, 16,000)

m) The depth of water reached a maximum at 30 minutes.

F → Rel Max @ 30 mins

Abs Max @ 90 mins