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.

Rel Min Rel Min Dom: time (mins) [0, 120]

y-int (0, 4)

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	4.5	5

Abs Max

Range: Depth (ft) [4, 12]

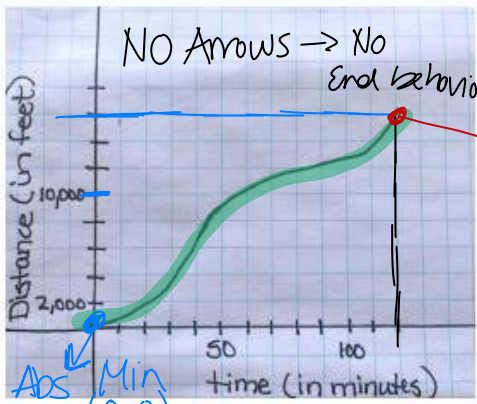
1. Use the data collected by Alonzo to interpret the key features of this relationship.

Increase: (0, 30) ∪ (60, 90) Decrease: (30, 60) ∪ (90, 120)

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
time (mins)
$0 \le x \le 120$

Range
Distance (ft)
$0 \le y \le 16{,}000$



Increase (0, 120)

Abs Max (120, 16,000)

x-int: (0, 0)

y-int: (0, 0)

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 → chart goes ↑ and down

b) The distance traveled is always increasing.

T → distance cannot decrease

c) The distance traveled is a function of time.

T → passes 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 → time cannot be negative

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

F → (0,4)

g) The distance traveled increases and decreases over time.

F → cannot decrease

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

F → hit 12 ft

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

F → [0, 16000]

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

T → that's what chart says

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 → (120, 16000) → Absolute Max

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

F → Relative Max, not Absolute

(90, 12)

mins ft