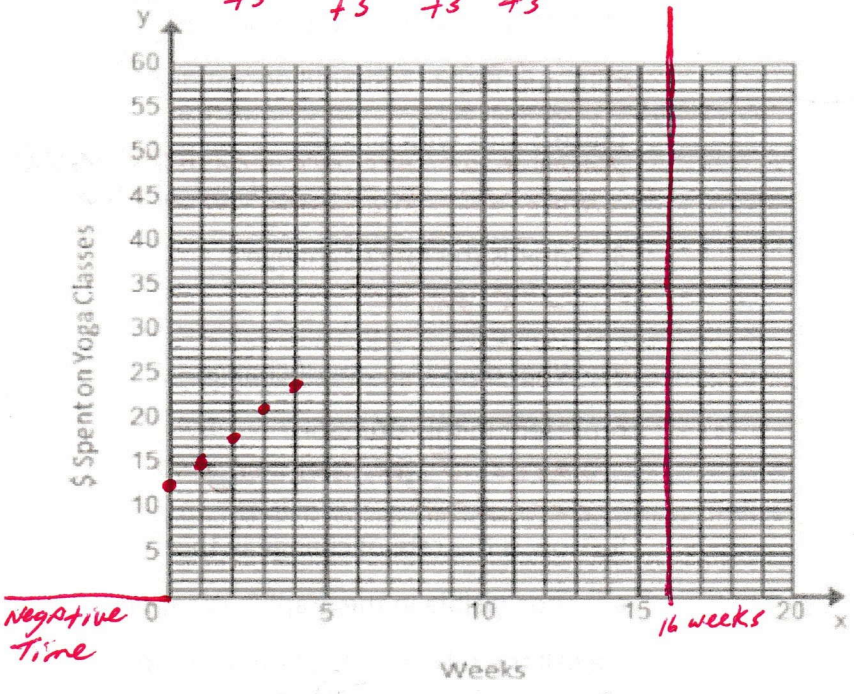
2.1 Notes: Key Features of a Linear Graph

Learning Target: I can identify the key features of a linear graph: slope, x & y intercepts, domain, range.

Example 1: Marlene has signed up for Yoga classes at her local gym. It costs her $12 to join and then $3 for one class a week. The Yoga class special is running for 4 months. (16 weeks)

weeks	X	0	1	2	3	4
$	Y	12	15	18	21	24

+3 +3 +3 +3



1. Use the scenario to create data points. Create a table and a graph of this data.

2. Is this situation discrete or continuous data? Should we connect these points with a line?
Can't pay for part of a class - Do not connect w/ a line

3. What is the rate of change?
$ 3 per class

4. What does the rate of change represent in this situation? cost per yoga class

5. How is the rate of change in this situation visible in the graph? What do we call the rate of change on the graph? Increasing (slope)

6. What is the x-intercept? What does the x-intercept represent in this situation? N/A → can't have negative time	7. What is the y-intercept? What does the y-intercept represent in this situation? (0, 12) cost to join the gym before paying for any classes (initial value ("b"), start)
8. What is the reasonable domain for Marlene's situation? Are there any values that would be unreasonable to include? (x's; weeks) {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16} - No partial #'s, nothing > 16	9. What is the reasonable range for Marlene's situation? Are there any values that would be unreasonable to include? (y's; $) {12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60}

10. Write an equation in function notation to represent the situation. $f(x) = 3x + 12$ (slope ROC; y-int (initial value))

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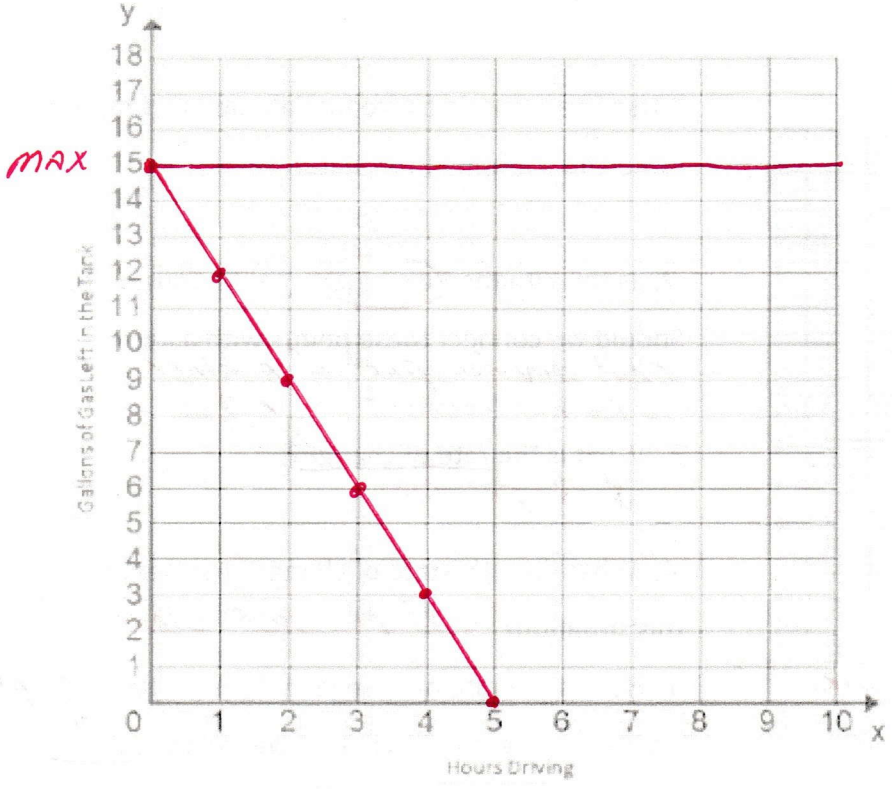
Example 2: Reid is taking a trip to see his family in Nebraska. His gas tank will hold a maximum of 15 gallons of gas. He will use 3 gallons of gas each hour he drives.

Hours	X	0	1	2	3	4	5
gallons	Y	15	12	9	6	3	0
		-3	-3	-3	-3	-3	

1.Use the scenario to create data points. Create a table and a graph of this data.



2. Is this situation discrete or continuous data? Should we connect these points with a line?

Hours + gallons are both measureable in parts → connect w/ a line

3. What is the rate of change?

-3 gallons

4. What does the rate of change represent in this situation?

looses 3 gallons of gas each hour

5. How is the rate of change in this situation visible in the graph? What do we call the rate of change on the graph?

Decreasing → slope

(~~Initial value~~)

6. What is the x-intercept? What does the x-intercept represent in this situation? (5, 0) H G

It will take 5 hours to run out of gas

7. What is the y-intercept? What does the y-intercept represent in this situation? (0, 15) H G

Before the trip begins, she has 15 gallons of gas in her tank

8. What is the reasonable domain for Reid's situation? Are there any values that would be unreasonable to include? (x's) (hours)

$0 \leq \text{hours} \leq 5$

min max

Anything between 0 + 5 hours is Appropriate

9. What is the reasonable range for Reid's situation? Are there any values that would be unreasonable to include? (y's) (gallons)

$0 \leq \text{gallons} \leq 15$

min max

Anything between 0 + 15 gallons is appropriate.

10. Write an equation in function notation to represent the situation. $f(x) = -3x + 15$