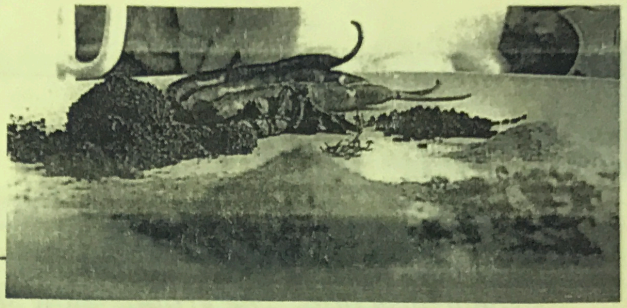
# 4.1 Some of This, Some of That

*A Develop Understanding Task*



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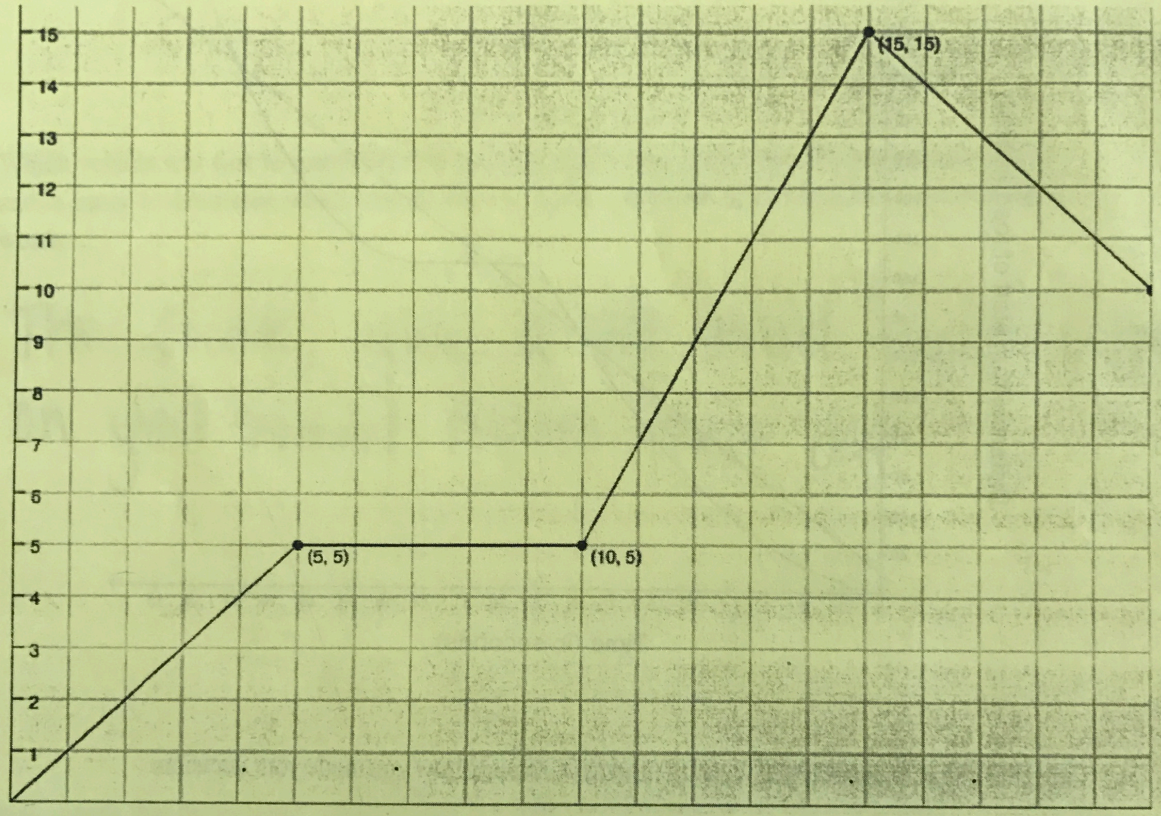
1. Create a story that would match the graph below. Be specific about what is happening for each part of your story. Include what you know about linear equations, domain, and rates of change.




stories were shared during class. x & y values should have been labeled

2. If you were to write equations to match each piece of your story (or section of the graph), how many would you write? Explain.

4, because there are 4 sections to the graph

3. Write each of these equations. Explain how the equations connect to your story and to the graph.

$y = x$ from $x = 0$ to $x = 5$

$y = 5$ from $x = 5$ to $x = 10$

$y = 2x - 15$ from $x = 10$ to $x = 15$

$y = -x + 30$ from $x = 15$ to $x = 20$

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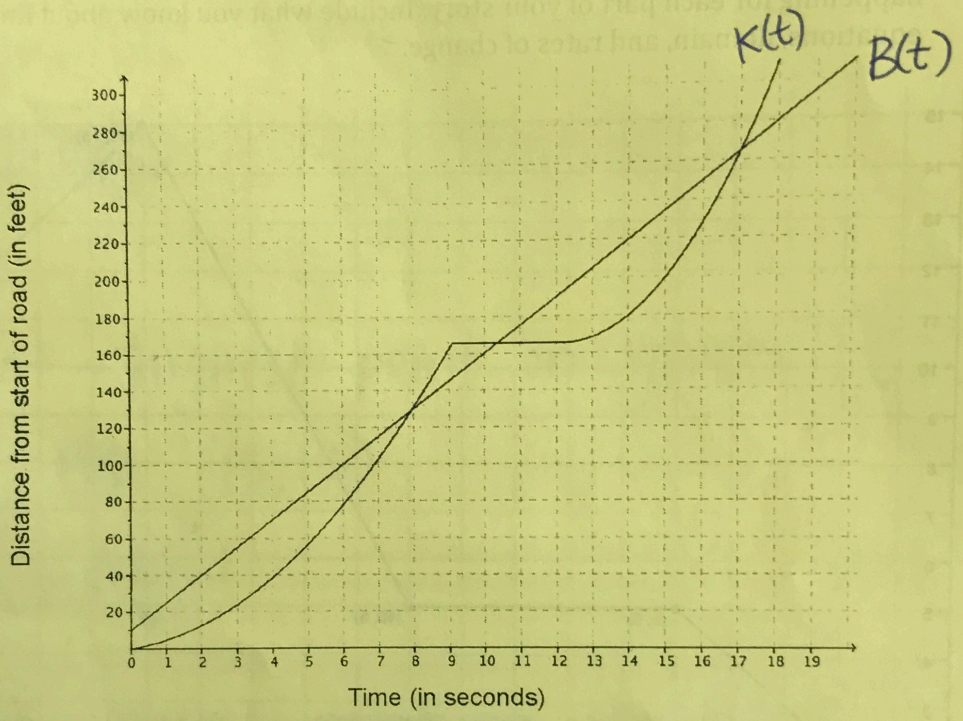
Name_____ Date_____

TASK 7

# Bike and Truck

*A bicycle traveling at a steady rate and a truck are moving along a road in the same direction. The graph below shows their positions as a function of time. Let B(t) represent the bicycle's distance and K(t) represent the truck's distance.*




1. Label the graphs appropriately with B(t) and K(t). Explain how you made your decision.

The instructions explain that the bike was traveling at a steady rate so it would have a constant rate of change, which must be the straight line. No specifications were mentioned about the truck so it must be the other function.

Note: Some inconsistencies exist in how the graphs model the real-life movement of a bike and truck (e.g., a vehicle would not come to an immediate stop at 9 seconds). A graph that more realistically depicts the movement of a bike and truck is available at http://www.nctm.org/PtA/.



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TASK 7

2. Describe the movement of the truck. Explain how you used the values of B(t) and K(t) to make decisions about your description.

Look at the function K(t), describe why it would have that shape.

3. Which vehicle was first to reach 300 feet from the start of the road? How can you use the domain and/or range to determine which vehicle was the first to reach 300 feet? Explain your reasoning in words.

The truck, give a ~~that~~ valid explanation on you would figure that out

4. Jack claims that the average rate of change for both the bicycle and the truck was the same in the first 17 seconds of travel. Explain why you agree or disagree with Jack.

Disagree, at 17 seconds the truck and bike were at the same distance, however the bike started in front ~~of~~ the truck so the truck must have been moving faster.

## Domain - all possible x-values

graph on front page

interval notation: $[0,100]$

↑ square bracket because 0, and 100 are included

set notation: $\{x \mid 0 \leq x \leq 100\}$

## Range - all possible y-values

graph on Front page

$[0,15]$

$\{y \mid 0 \leq y \leq 15\}$

## Maximum point - highest point on graph

graph on Front page

(15,15)

↑ ordered pair

## Minimum point - lowest point on the graph

graph on front page

(0,0) → ordered pair

## Piecewise function notation

Piecewise - means taking pieces of functions and combining them into one function

ex. From front page #3

$$f(x) = \begin{cases} x & 0 \leq x < 5 \\ 5 & 5 \leq x < 10 \\ 2x-15 & 10 \leq x < 15 \\ -x+30 & 15 \leq x \leq 20 \end{cases}$$

↑ equations from graph

↑ tells us where to use each equations