Expressions and Equations
Problem 1.2: From Atlantic City to Lewes
Time, Rate, and Distance

Name: _____
2/27/19

A **variable** is _____

_____

One way in which values of real-life variables may change is with the passage of time. You saw this in the jumping jack experiment. The number of jumping jacks changes based on the elapsed time.

Ocean Bike Tours Test Ride: Atlantic City → Cape May

Sydney follows the cyclists in a van with a trailer for camping gear and bicycles. Every half-hour, he records in a table the distances the cyclists have traveled from Atlantic City.

Atlantic City to Cape May

Time (h)	Distance (mi)
0	0
0.5	8
1.0	15
1.5	19
2.0	25
2.5	27
3.0	34
3.5	31
4.0	38
4.5	40
5.0	45

As time increases, how does the distance change?

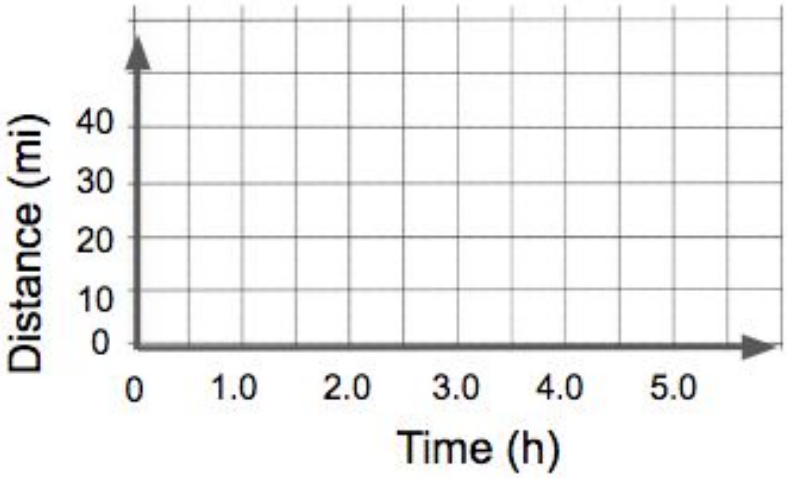
From Cape May, the cyclists and the van take a ferry across Delaware Bay to Lewes (LOO-is), Delaware. They camp that night in a state park along the ocean.

The business partners examine Sidney's (*time*, *distance*) data. They hope to find patterns that might help them improve the Ocean Bike Tours route and schedule. First they have to answer this question:

What story does the pattern in the table tell?

A

1. Plot the (*time*, *distance*) data pairs on a coordinate grid.



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2. What interesting patterns do you see in the (*time*, *distance*) data?

B

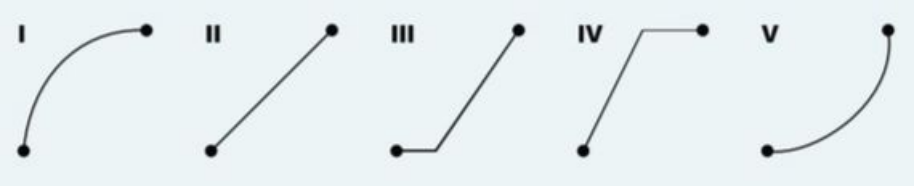
1. At what times in the trip where the cyclists traveling fastest?
   At what times were they traveling slowest?

2. Explain how your answer is shown in the table.

3. Explain how your answer is shown by the pattern of points on the graph.

C Connecting the points on a graph can help you see patterns more clearly. It also helps you consider what is happening in the intervals between the points. Different ways of connecting the given data points tell different stories about what happens between the points.

Consider the data (4.5, 40) and (5.0, 45) from the first day of the Ocean Bike Tours trip. Here are five different ways to connect the graph points on the plot of (*time*, *distance*).



Match the given connecting paths to these travel stories.

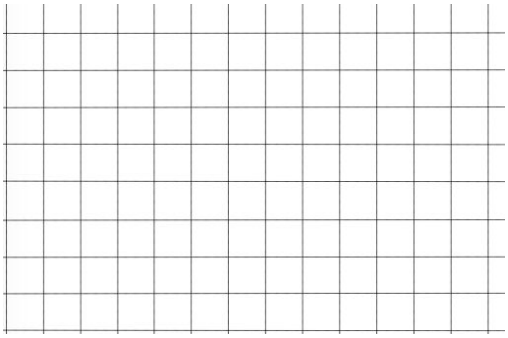
1. Celia rode slowly at first and gradually increased her speed.
2. Theo rode quickly and reached the Cape May ferry dock early.
3. Malcolm had to fix a flat tire, so he started after the others.
4. Tony and Sarah started off fast. They soon felt tired and slowed down.
5. Liz pedaled at a steady pace through this part of the trip.

ACE Problems (from Page 22 and 24)

4. Before deciding that bike tour customers could ride 60-90 miles each day, the Ocean Bike Tours partners went on a test ride. The (*time*, *distance*) data for their ride are shown in the table below.

Ocean Bike Tours Test Ride

Time (h)	0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	5.0	5.5	6.0
Distance (mi)	0	10	19	27	34	39	36	43	53	62	66	72



a.) Plot these data on the coordinate graph. Make sure to add scales and labels.

b.) At what time(s) in the ride were the business partners riding fastest? How is that information shown in the graph?

c.) At what time(s) in the ride were they riding slowest? How is that information shown in the graph?

d.) How would you describe the overall pattern in cyclist speed throughout the test ride?

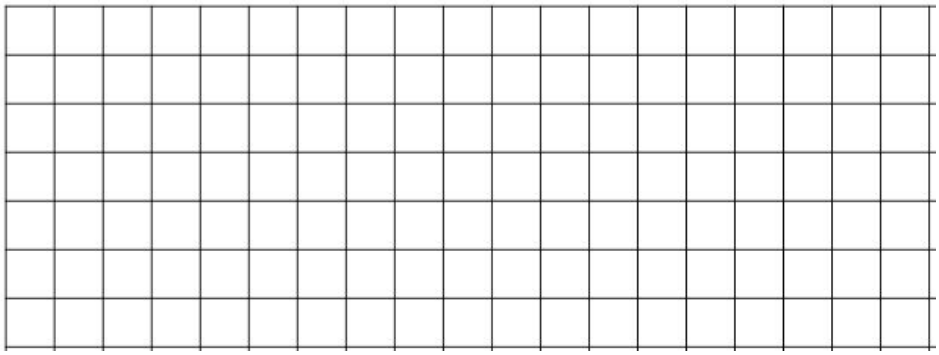
e.) What might explain the dip in the distance data between 2.5 and 3.5 hours?

6. Katrina's parents kept a record of her growth in height from birth until her 18th birthday. Their data is shown in the table below.

Katrina's Height

Age (yr)	Height (in.)
birth	20
1	29
2	33.5
3	37
4	39.5
5	42
6	45.5
7	47
8	49
9	52
10	54
11	56.5
12	59
13	61
14	64
15	64
16	64
17	64.5
18	64.5

a.) Make a coordinate graph of Katrina's height data.



b.) During which time interval(s) did katrina have her greatest "growth spurt"?

c.) During which time interval(s) did Katrina's height change the least?

d.) Would it make sense to connect the points on the graph? Why or why not?

e.) Is it easier to use the table or the graph to answer parts (b) and (c)? Explain.