Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Variables and Patterns***

**Investigation 3.2**

***Labsheet***

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hour \_\_\_\_

**A.** When the bike tour is over, the riders will put their bikes and gear into vans and  
head back to Atlantic City.

**1.** Complete the rate table to show how distance depends on time for different  
average speeds.

**Distance Traveled at Different Average Speeds**

|  |  |  |  |
| --- | --- | --- | --- |
| **Time (h)** | **Distance for Speed of 50 mi/h** | **Distance for Speed of 55 mi/h** | **Distance for Speed**  **of 60 mi/h** |
| 0 | 0 |  |  |
| 1 | 50 |  |  |
| 2 | 100 |  |  |
| 3 |  |  |  |
| 4 |  |  |  |
|  |  |  |  |

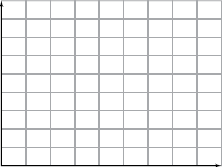
**2.** Write an equation to show how distance *d* and time *t* are related for travel at  
each speed.

**a.** 50 miles per hour \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**b.** 55 miles per hour \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**c.** 60 miles per hour \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**3.** Graph the (*time, distance*) data for all three speeds on the coordinate grid  
below. Use a different color for each speed.



**4. a.** Look for patterns relating distance and time in the table and graph.

Explain how the pattern shows up in the table and graph.

**b.** Theo observed that the coefficient of the independent variable in each equation is the average speed or unit rate. Is he correct? Explain.

**5. a.** Explain how you can use the table, graph or equation to find the

distance when *t =* 6 hours.

**b.** How can you use the table, graph, or equation to find the time when the distance is 275 miles? Explain.

**B.** A smartphone plan charges $.03 per text message.

**1. a.** Complete the table of monthly charges for 0; 500; 1,000; 1,500;

2,000; and 2,500 text messages.

**Smartphone Monthly Charges**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Number of Text Messages** | 0 | 500 | 1,000 | 1,500 | 2,000 | 2,500 |
| **Cost** |  |  |  |  |  |  |

**b.** Use the table. What is the cost for 1,000 messages?

For 1,725 messages?

**c.** Use the table. How many text messages were sent in a month if the  
charge for the messages is $75?

If the charge is $60?

If the charge is $18?

**2. a.** How is the monthly charge *B* for text messages related to the number  
 of text messages *n*?

Write an equation that represents the monthly charge for *n* messages.

**b.** Use the equation you wrote in part (a) to find the cost for 1,250 text  
messages in one month.

**3. a.** Sketch a graph of the relationship between text message charges and

number of messages.

**Smartphone Monthly Charges**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
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**b.** Explain how you could use the graph to answer the questions in  
parts (1b), (1c), and (2b).