

## Investigation 3.2 Inverse Variation Patterns

**Cordova's Travel Notes**

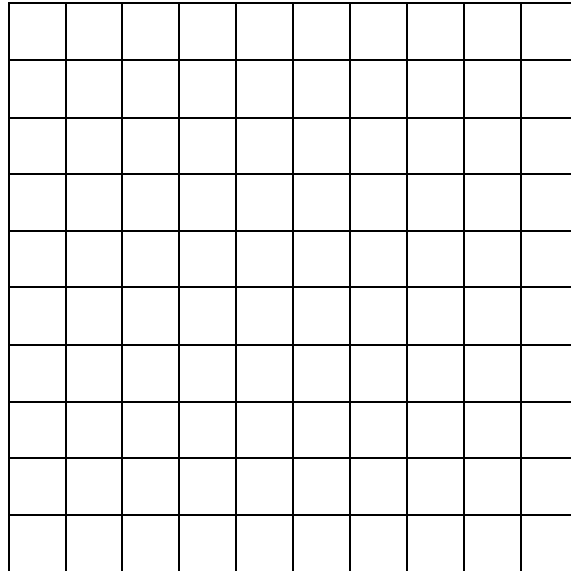
Date	Notes	Travel Time
February 15	Traveled by plane.	1.5 hours
May 22	Drove.	10 hours
July 3	Drove. Stopped for repairs.	14 hours
November 23	Flew. Flight delayed.	4 hours
December 23	Took overnight train.	18 hours

- Calculate the average speed in miles per hour (mph) for each trip. Record the results in the table below.

**Cordova's Baltimore Trips**

Travel Time (hr)	1.5	10	14	4	18
Average Speed (mph)					

- Plot the data. Draw a line or curve that models the data pattern.



As the travel time increases, the average speed \_\_\_\_\_.

This is an \_\_\_\_\_ variation pattern.

- Write an equation for the relationship between **travel time  $t$**  and **average speed  $s$** .

\_\_\_\_\_

4. Use your equation to find the average speed for 500-mile trips that take:

6 hours \_\_\_\_\_

8 hours \_\_\_\_\_

12 hours \_\_\_\_\_

16 hours \_\_\_\_\_

5. Add the (*travel time, average speed*) data from #4 to your graph. Do the new points fit the graph model you sketched for the original data? Yes/no.

**Part B**

**Travel Times for Different Speeds**

<b>Average Speed (mph)</b>	<b>30</b>	<b>40</b>	<b>50</b>	<b>60</b>	<b>70</b>
<b>Travel Time (hr)</b>	<b>10</b>	<b>7.5</b>	<b>6</b>	<b>5</b>	<b>4.3</b>

1. How far is it from Detroit to Mackinac Island? \_\_\_\_\_.

2. What equation relates **travel time  $t$**  to **average speed  $s$** ? \_\_\_\_\_

3. As the average speed increases, the travel time \_\_\_\_\_.

How would that pattern appear in a graph? \_\_\_\_\_

\_\_\_\_\_

How is it shown by your equation? \_\_\_\_\_

\_\_\_\_\_

4. Predict the travel times if the Cordova's drive at average speeds of:

• 45 mph \_\_\_\_\_

• 65 mph \_\_\_\_\_

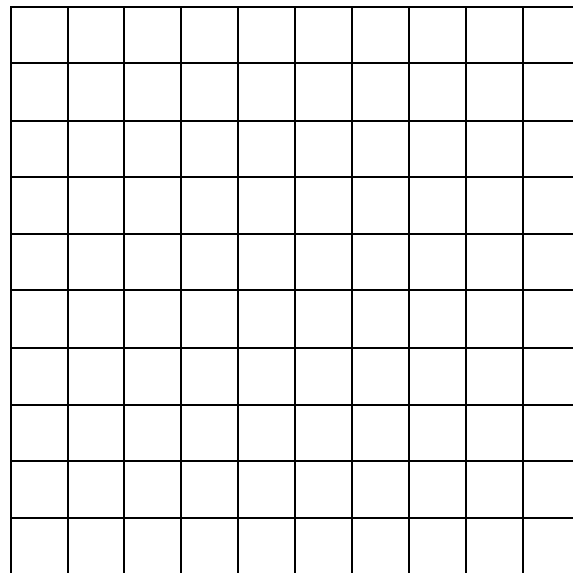
**Part C**

Suppose Mr. Cordova decides to aim for an average speed of 50 mph for the trip to Mackinac Island.

1. Complete the table and graph to show how the **distance traveled  $d$**  will increase as **time  $t$**  passes. Show times from when the family leaves home to when they reach their destination.

**Trip to Mackinac Island**

<b>Travel Time (hr.)</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>Distance (mi.)</b>							



2. Write an equation for the **distance  $y$**  the family travels in **hours  $x$** .

\_\_\_\_\_

3. As time passes, the distance \_\_\_\_\_.

4. Compare the (time, distance traveled) graph and equation with the (time, average speed) graphs and equations in Part A and B. Explain.