Algebra 1 Investigative Task 7 Name_____
Chapter 1 **Vacation Expenses**

With gas prices going up, it is common to hear people say that they are changing their lifestyle to save money on gas. For this project, the standard car has an efficiency rating of 25 miles per gallon.

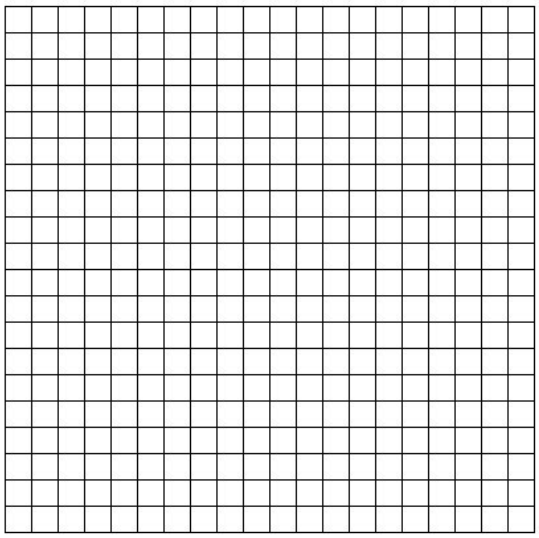
The Johnson Family wants to drive in their standard car to see their relatives who live 1,000 miles away. They plan to drive 500 miles per day and stay in a hotel once on the away trip and once on the return trip. The cost of the hotel is $75 per night. The lodging once they arrive is free (relatives). Including the travel days, the entire trip should last 8 days (4 travel, 4 with relatives). They have budgeted $60 per day for food.
This amount will stay constant for all 8 days of the vacation.

Part A: Food/Lodging

1. Complete the table below to find how much total will be spent on food and lodging?

Day	Lodging Expenses for the day	Food Expenses for the day	Total for the day	Grand Total
1	75	60	135	135
2	0	60	60	195
3				
4				
5				
6				
7				
8				

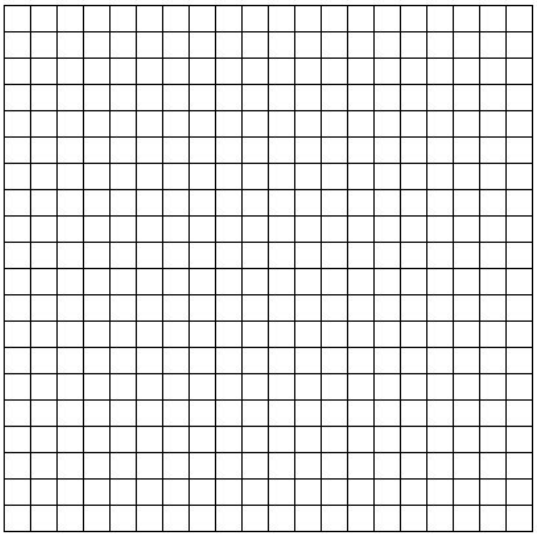
Total Food Expenditures



2. Write a function called f(t) that describes the total amount that will be spent on **food** over ***t*** days.

   f(t) =

Grand Total Expenditures



3. Graph the function f(t) on the top graph to the right.

   Is f(t) linear? Why?

4. Create a line plot that shows the Grand Total expenses over the 8 days.

   Is this relation linear? Why?

5. Find the increase for Grand Total expenses from day 1 to 3.

6. How much money did the Johnson's save by staying with their family instead of hotels? Show your work.

Part B: Gas

Important Information: The standard car has an efficiency rating of 25 miles per gallon. The Johnson Family wants to drive in their standard car to see their relatives who live 1,000 miles away. After their vacation, they will drive home.

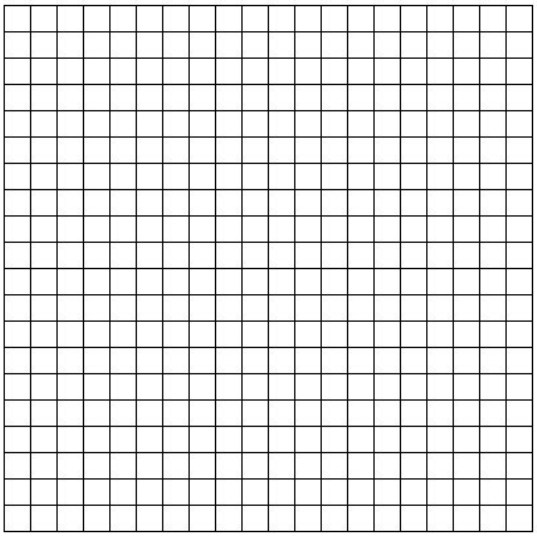
7. How many total miles will be driven? Show your work.

8. How many total gallons will the standard car require for the trip? Show your work.

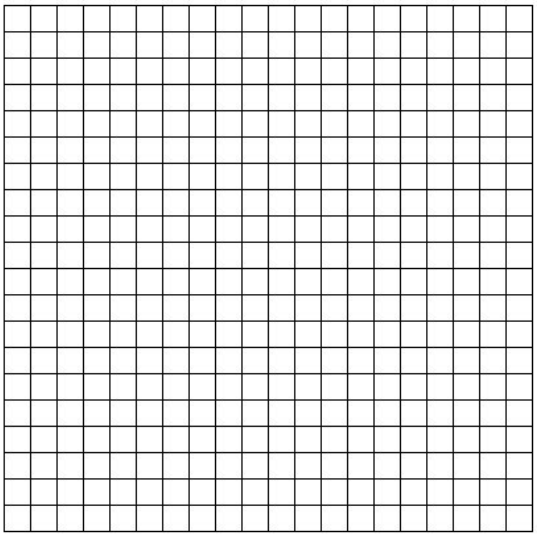
9. Complete the table to chart the cost of gas and the total cost of the trip given different gasoline prices. Create a graph for the Total Cost of Gas and the Total Cost of the trip where the input, x, is the gas price per gallon. The cost of the trip without any gas expenses was calculated in question 1.

Gas Price Per Gallon	Total Cost of Gas	Total Cost of the Trip
$0		
$0.50		
$1.00		
$1.50		
$2.00		
$2.50		
$3.00		
$3.50		
$4.00		
$4.50		
$5.00		

Total Cost of Gas



Cost of the Trip based on gas price



10. Write a function named g(x) to describe the total cost of gas where x is the gas price per gallon.

11. Is g(x) linear? Why?

12. Write a function named c(x) to describe the total cost of the trip where x is the gas price per gallon.

13. Is c(x) linear? Why?

14. How is the function c(x) different from g(x) AND how does this affect the graphs of each function?

Part C: Predictions and Recommendations

15. When gas cost $4.00, what percent of the total cost of the vacation is comprised of gas expenses?

16. What is the Total Cost of the Trip if the gas price is $7.00 per gallon?

17. What is the Gas Price per Gallon if the Total Cost of trip is $5,000?

16. How much would gas have to cost before you recommend that the Johnson's skip their vacation? Show calculations to back up your recommendation.

17. Give 3 reasons why this situation is an over-simplification of the issue. Your reasons should demonstrate why the situation is more complex than the way it is described above. Think of your own family vacations.

1.

2.

3.

Part D: Challenge Questions

18. Let the price of gas per gallon equal ***x + 5.*** Find c(x+ 5)

19. Graph c(x + 5)

20. Describe the difference between the graphs of c(x) and c(x + 5).