Classified ads in the *Ithaca Journal* offered several used Toyota Corollas for sale. Listed below are the ages of the car and their advertised prices.

1) What are the two variables in the chart? Which would you call the **explanatory variable** and which would you call the **response variable?**

2) Given your response above, fill in the blanks in the following sentence:

   The behavior of _____ explains the behavior of _____.

3) Soon, but not yet, we will make a scatterplot of this data. The horizontal axis will be labeled with the explanatory variable and the vertical axis will be labeled with the response variable. Think about this and fill in the following prediction below:

As _____increases, _____

_____.

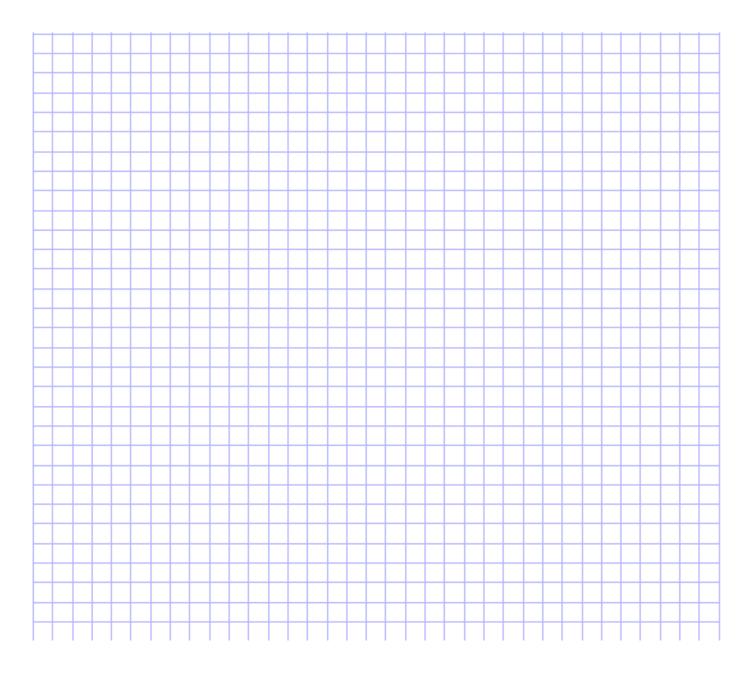| Age (yr)	Price Advertised ($)
1	13,990
1	13,495
3	12,999
4	9500
4	10,495
5	8995
5	9495
6	6999
7	6950
7	7850
8	6999
8	5995
10	4950
10	4495
13	2850

Now Graph the scatterplot:

What is the Domain of the explanatory variable?

Write the Domain as a set:

What is the range of the Response variable?

Write the Range as a set:

Think carefully about how to make a scale for both horizontal and vertical axis.   Be sure to label your axes.

4) Very carefully draw a line that you think models the association between the two variables. How good a fit is the line to the data? Rate is on a scale from 1 to 10, where 1 would be a completely random pattern of points and 10 would be a perfect fit.

5) Where does your line hit the y-axis?   What is the x-coordinate at this point?

What does this point represent in the context of this data?

6) Use two points on your line to find its slope. Remember that "slope" is the ratio of the vertical change in a line to its horizontal change from point to point. A line is the only curve in which this ratio is a constant (which means it never changes.)

What are the units of the slope?

Write the slope as a unit measure.

What does the slope mean in the context of this data?

For every increase of one _____

_____.

A **RELATION** is a set of ordered pairs.

- Does the data form a relation?   If so, write out the set of ordered pairs that forms this relation.

What is the Domain of the explanatory variable?

Write the Domain as a set:

What is the range of the Response variable?

Write the Range as a set:

- Does the line that you drew form a relation? If so, write out the set of ordered pairs that forms this relation.

What is the Domain of the explanatory variable?

Write the Domain as a set:

What is the range of the Response variable?

Write the Range as a set:

Now put the ordered pairs into these charts:

DATA	
Age (yr)	Price Advertised ($)
0	
1	
1	
2	
3	
4	
4	
5	
5	
6	
7	
7	
8	
8	
9	
10	
10	
11	
12	
13	

LINEAR MODEL	
x	y
0	
1	
1	
2	
3	
4	
4	
5	
5	
6	
7	
7	
8	
8	
9	
10	
10	
11	
12	
13	

There are some very interesting differences between the data and the model that represents the data. Use this space to make some notes about those differences- we will shortly discuss the differences and you will want to be prepared.

Now we are going to define the word **_FUNCTION_**. This is a space for your notes.

Here are some questions you should be able to answer about functions:

- Where is this defined in your book?

- What is the difference between a **function** and a **relation**?

- How are **function** and **relation** defined in English? Do those definitions help you to remember the mathematical definitions?

- Like all mathematical ideas, you should be able to represent both **functions** and **relations** in four ways- can you represent **functions** and **relations**
  - Verbally

  - Algebraically

  - Graphically

  - Numerically

- How does the calculator help you to work with **functions** and **relations**?