

Name: _____

Date: _____



SCATTER PLOTS AND LINES OF BEST FIT

N-GEN MATH[®] 8



In science and other areas, we often want to determine if there is an association, linear or otherwise, between two variables that we measure. To initially “see” the relationship, we plot pairs of the measurements on what is known as a **scatter plot**.

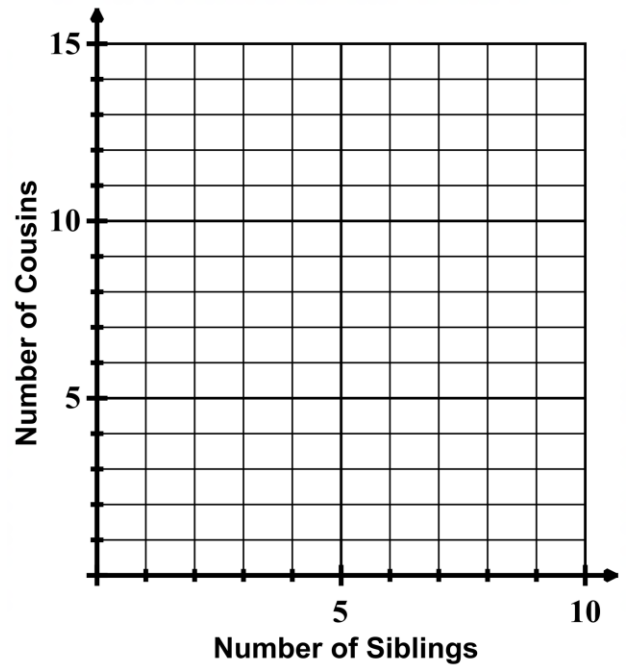
Exercise #1: Students in Mr. Rivera’s math class wanted to see if there was an association between the number of siblings a student has and the number of first cousins she or he has. They asked 12 of the students in class and found the following.

Siblings, x	2	6	3	2	5	3	4	7	3	1	6	1
Cousins, y	5	10	8	7	11	7	8	14	5	4	2	3

(a) Create a scatter plot of this data set on the grid.

(b) **Generally**, does the number of cousins increase as the number of siblings increases?

(c) Do any of the data points in the grid appear to be **outliers**? (They go against the trend.) Explain.



(d) Ignoring the outlier from (c) use your ruler to draw a **line of best fit** through the data.

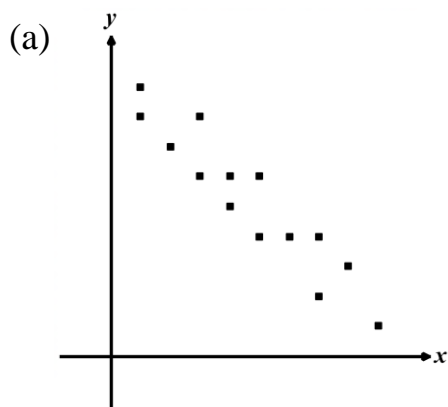
(e) Is the slope of the line of best fit positive or negative? How does this relate to your answer in (b)?

(f) To the nearest whole number, what does the y -intercept appear to be? What does this tell you about siblings and cousins?

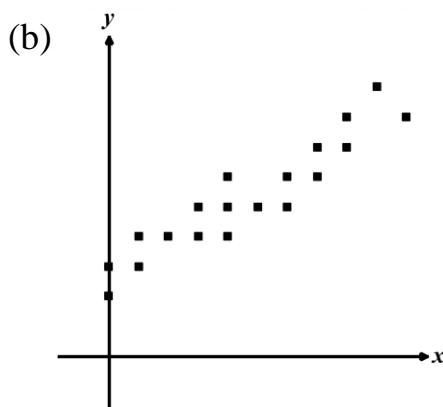


In *Exercise #1* there was a **positive association** or **correlation** between the two variables because as one of them increased, so did the other (in general). We can also have **negative associations**, which occur when one variable decreases as the other increases.

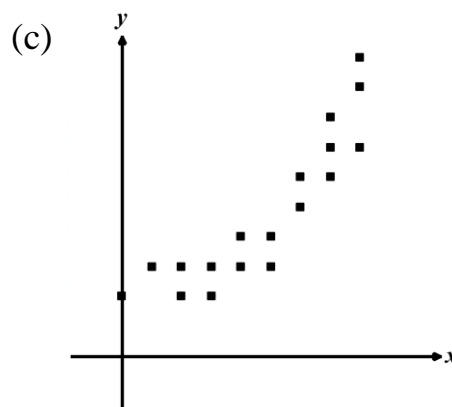
Exercise #2: For each scatter plot shown, draw a line of best fit using a ruler. Then, circle whether the association appears to be **positive** or **negative**.



positive or negative



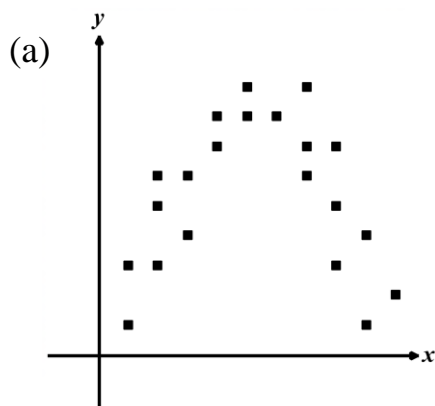
positive or negative



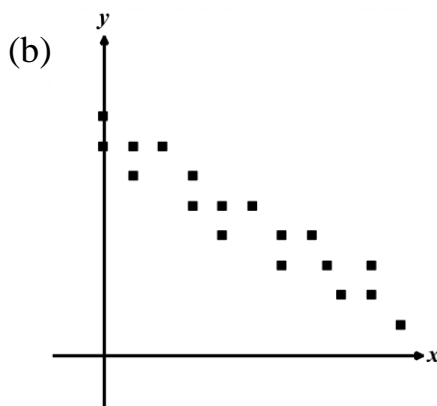
positive or negative

In the scatter plots for (a) and (b) above you should have seen about as many points above the line as below the line for the entire length of the line. But, the graph in (c) is better fit by a **non-linear** curve than a line. You will work with **curves of best fit** in other courses.

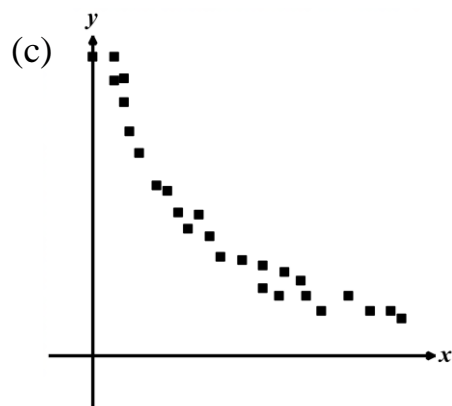
Exercise #3: For each scatter plot shown below, circle if you believe it is **linear** or **non-linear**. If you believe it to be linear, draw a line of best fit. If you think it is non-linear, draw a curve of best fit.



linear or non-linear



linear or non-linear



linear or non-linear



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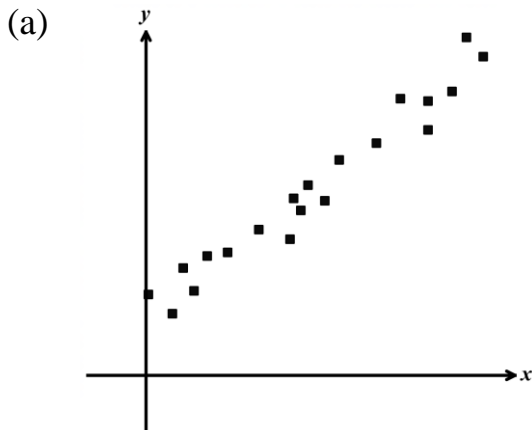


SCATTER PLOTS AND LINES OF BEST FIT

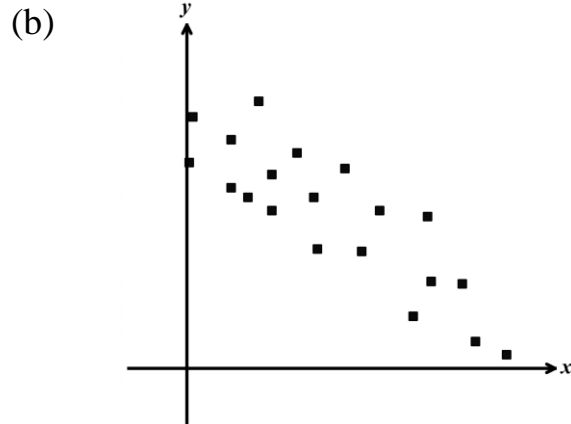
N-GEN MATH[®] 8 HOMEWORK

FLUENCY

1. For each scatter plot shown below, draw line of best fit. Then, circle whether the association between x and y is positive or negative.

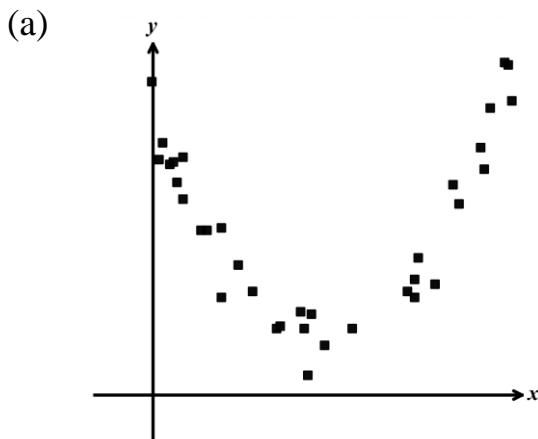


positive or negative

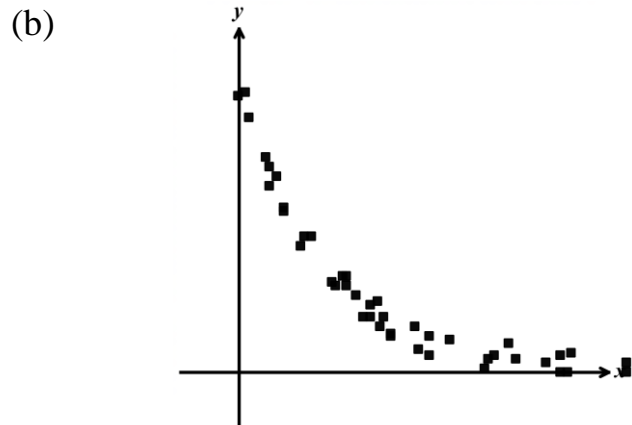


positive or negative

2. For each scatter plot shown below, determine if you think it is linear or non-linear. Then, draw either a line or curve of best fit.



linear or non-linear



linear or non-linear



USING YOUR MATH

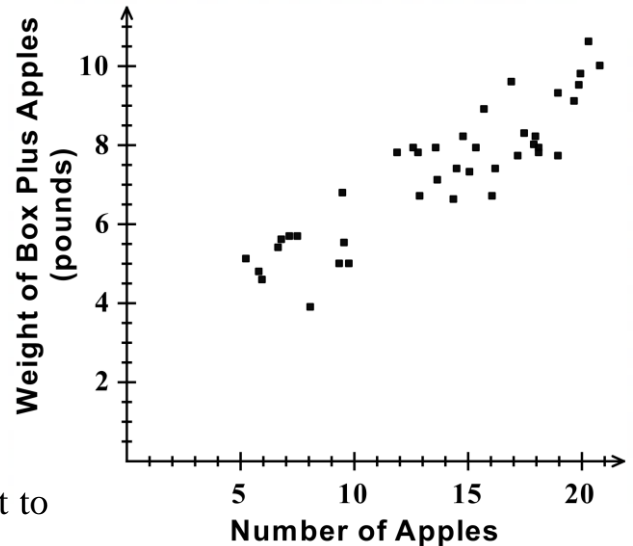
3. Boxes are being loaded with apples. All of the boxes are the same size but have differing numbers of apples in them. Each box is weighed, and the weight is compared to the number of apples in the box. The results are shown in the scatter plot below.

(a) Draw a line of best fit through the data. Extend it so that it intersects with the y-axis.

(b) Is this a positive or negative association between the number of apples and the weight?

(c) Estimate the y-intercept of your line of best fit to the nearest half-pound.

(d) How can you interpret your answer from (c) in the context of this problem?



4. A middle school wanted to visualize the association between how many days a student is absent and what their overall grade point average was from 6th through 8th grade. The results for 80 students are shown in the scatter plot below.

(a) Draw a line of best fit through this data.

(b) Why does it make sense that this is a negative association?

(c) Are there any **outliers**? If so, circle them.

