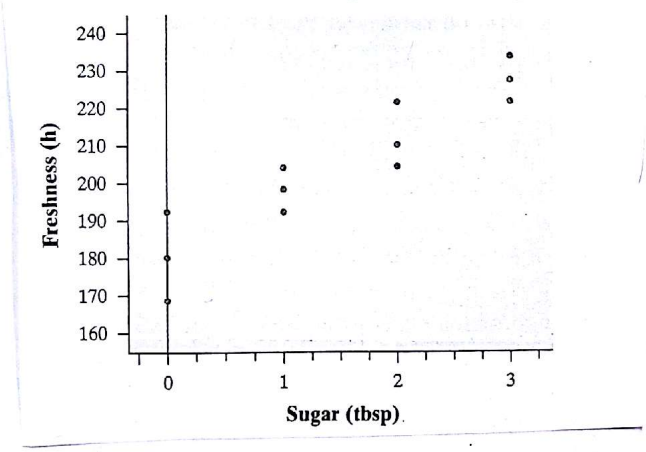
AP Statistics **Name:**

Special Problem 3 (S2017)

Directions: *This is an individual assignment*. You may use your book and notes but no other outside resources including the internet. Show all your work. Indicate the methods you use, because you will be graded on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

Problem: Two statistics students went to a flower shop and randomly selected 12 carnations. When they got home, the students prepared 12 identical vases with exactly the same amount of water in each vase. They put one tablespoon of sugar in 3 vases, two tablespoons of sugar in 3 vases, and three tablespoons of sugar in 3 vases. In the remaining 3 vases, they put no sugar. After the vases were prepared, the students randomly assigned 1 carnation to each vase and observed how many hours each flower continued to look fresh. A scatterplot of the data is shown below.



a. Briefly describe the association shown in the scatterplot.

b. The equation of the least squares regression line for these data is $\hat{y} = 180.8 + 15.8x$. Interpret the slope of the line in the context of the study.

c. Calculate and interpret the residual for the flower that had 2 tablespoons of sugar and looked fresh for 204 hours.

d. Suppose that another group of students conducted a similar experiment using 12 flowers, but include different varieties in addition to the carnations. Would you expect the value of r^2 for the second group's data to be greater than, less than, or about the same as the value of r^2 for the first group? Explain.