

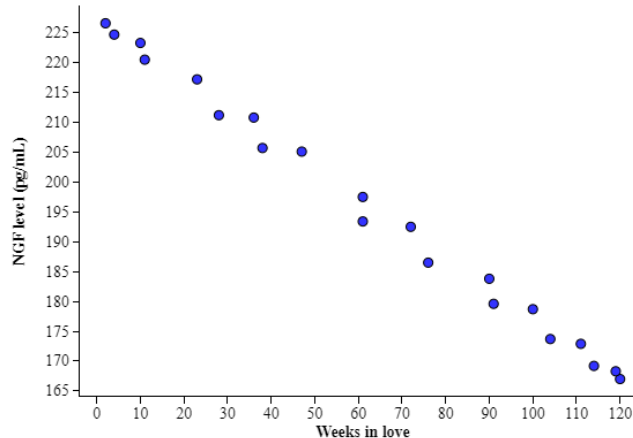


# For the Love of Stats



Researchers found that nerve growth factor (NGF), a neurotrophin found in blood plasma, has higher concentrations in people that are newly in love than in those who have been in a relationship for a longer time. To understand this relationship, a group of volunteers who are in relationships were asked how long they have been in love (in weeks). Then they measured the NGF levels in their blood. The data are given below.

1. Use your calculator to create a scatterplot showing the relationship between *Weeks in love* and *NGF level*. Sketch the plot below.



2. Describe the relationship shown in the scatterplot.

There is a strong, negative, linear relationship between weeks in love and NGF level (pg/mL) with no unusual features.

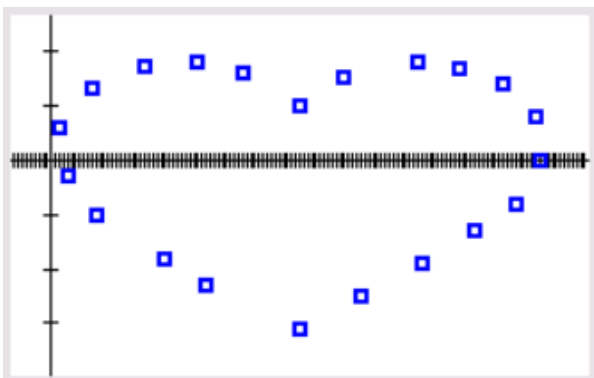
3. Write the regression equation for predicting *NGF level* from the number of *Weeks in love*.

$$\hat{NGF} = 227.0027 - 0.4999 (\text{Weeks})$$

4. Find  $r^2$  and interpret it in context.

About 99.4% of the variation in NGF level can be explained by the linear relationship with weeks in love.

5. Create a residual plot and sketch it below. What does this tell you about the relationship?



A linear model is not appropriate to model the relationship. The residual plot shows that the relationship is true love. 😊