

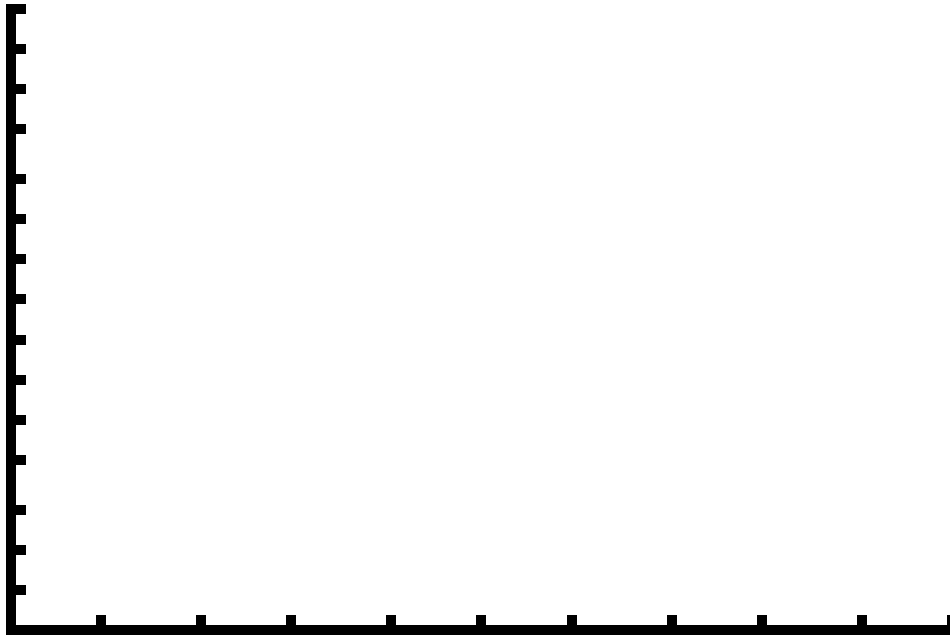
Bean Plant Growth

Name \_\_\_\_\_

Below are some data from an experiment on the growth of a bean plant grown in special lighting.

Day	1	2	3	4	5
Height	2.1	2.7	3.1	3.3	4.4

1. Make a scatter plot of the data. Let  $x$  be the number of day and  $y$  be the height of the plant in centimeters. Do not forget to title and label your scatterplot.



2. Complete the sentence below to describe the correlation between days and plant height.  
As the number of days,  $x$ , increase \_\_\_\_\_
3. Draw a line of best fit onto your scatter plot above. Make sure it contains two points you know the coordinates of. Then give an estimate for the correlation,  $r$ .
4. Estimate the residual for Day 5. Then interpret what that residual tells you about the location of Day 5 with respect to the regression line and how accurate the regression line would predict the height of the bean plant on day 5.

5. List two points that are on the line of best fit.
6. Use the two points to determine the slope of the line of best fit. Give your answer as a fraction and as a decimal rounded to the hundredths place.
7. Use one of the points you chose in number 5, and the slope from number 6, to write an equation of the line.  
You may use either the point slope equation  $y - y_1 = m(x - x_1)$  or the slope intercept equation  $y = mx + b$  to find your equation. If you use the point slope equation make sure you solve it for  $y$ .
- 8a. Give the slope and  $y$ -intercept of your line of best fit. Then interpret what each of them mean in the context of the problem.
- 8b. Use the equation from number 7 to predict the height of the bean plant in 20 days.
- 8c. What day will the bean plant reach a height of 9 cm.

9. Add a point to your scatter plot that would be an outlier for days.  
Label it point A.
10. Add a point to your scatter plot that would be an outlier for height.  
Call it point B.
11. Add a point to your scatter plot that would be an outlier for days and height. Call  
it point C.
12. Add a point to your scatter plot that would be an outlier for neither days or height.  
Call it point D. This is a joint outlier.

Below are some data from an experiment on the growth of a bean plant grown in special lighting.

Day	1	2	3	4	5
Height	2.1	2.7	3.1	3.3	4.4

9. Use your calculator to make a scatter plot of the data. Give the window from you calculator.
  
10. Now, use your the linear regression capabilities of your calculator to find the line of best fit and the correlation. Round to the nearest hundredths place.
  
11. Give the slope and y-intercept, accurate to two decimal places, of the line given to you by your calculator.
  
12. What does the slope and y-intercept mean in the context of this problem?
  
  
  
  
  
  
  
  
  
  
13. Use the equation from number 10 and your calculator to predict the height of the bean plant in 11 days.
  
  
  
  
  
  
  
  
  
  
14. Using the equation from number 10, predict how many days have passed if the bean plant is 10 cm tall

15. Using your calculator find the residuals for the given data.

16. Report the data point that is furthest in absolute value from the line of best fit and describe what the residual for that point means.

17. Report the data point that is closest in absolute value to the line of best fit and describe what the residual for that point means.