



### Connecting Algebra 2 to Statistics

Name \_\_\_\_\_

#### **Problem 2**

Determine whether an exponential function is a good model for the values in the table. Remember to start a new problem on your handheld. To insert a new problem, press   4: Insert 1: Problem.

x	-1	0	1	2	3
y	40.2	19.8	9.9	5.1	2.5

**Step 1:** Enter the data into a Lists and Spreadsheet Page

**Step 2:** Graph the data on a Data and Statistics Page

Describe the direction, form, and strength of the relationship in the scatter plot.

**Step 3:** Now, go back to your Lists and Spreadsheet Page and create a new list. Call this list  $\ln y$  for  $\log y$ . Plot the  $x$  values to the logarithm of the  $y$  values. But first, find the logarithmic values for all the  $y$  values in your table. You must enter a formula in line below the label  $\ln y$ . Once you have created the new list, insert a new data and statistics page at the end of your document and plot the  $x$  values against the  $\log y$  values ( $\ln y$ ).

Describe the transformation that occurred. Describe the form of the relationship.

Add the regression line by pressing Menu, 4: Analyze, 6: Regression, 2: Show Linear ( $a + bx$ ). Write the regression equation below.

**Step 4:** Insert a Calculator page and press Menu, 5: Statistics, 1: Stat Calculations, 4: Linear Regression ( $a + bx$ ). Does the linear regression show a strong correlation? Write your answer below along with the value of  $r$  to justify your response.

**Step 5:** Find the exponential model for your original data set. Now lets perform some algebra on your equation from Step 3 to transform it from a linear equation to an exponential equation.

Once you have found your exponential model algebraically, return to the original Data and Statistics Page and check your answer with the calculator generated exponential regression model. Once you are on the exponential scatter plot, press: Menu, 4: Analyze, 6: Regression, 8: Show Exponential. How does the Exponential equation found algebraically compare to that of the handheld's exponential model?

**Problem 3**

Determine whether an exponential function is a good model for the values in the table. Remember to start a new problem on the handheld.

x	1	3	5	7	9
y	6	22	54	102	145

**Step 1:** Enter the data into a Lists and Spreadsheet Page

**Step 2:** Graph the data on a Data and Statistics Page

Describe the direction, form, and strength of the relationship in the scatter plot.

**Step 3:** Now, go back to your Lists and Spreadsheet Page and create a new list. Call this list  $\ln y$  for  $\log y$ . Plot the x values to the logarithm of the y values. But first, find the logarithmic values for all the y values in your table. You must enter a formula in line below the label  $\ln y$ . Once you have created the new list, insert a new data and statistics page and plot the x values against the  $\log y$  values ( $\ln y$ ).

Describe the transformation that occurred. Describe the form of the relationship. Add the regression line by pressing Menu, 4: Analyze, 6: Regression, 2: Show Linear ( $a + bx$ ). Write the regression equation below.

**Step 4:** Insert a Calculator page and press Menu, 5: Statistics, 1: Stat Calculations, 4: Linear Regression ( $a + bx$ ). Does the linear regression show a strong correlation? Write your answer below along with the value of  $r$  to justify your response.

**Bonus:**

Continue with Problem 3

Go to the Lists and Spreadsheet Page and create a new list called  $\ln x$  for  $\log x$ . You will need to find the logarithm of the  $x$  values the same way you found the logarithm of the  $y$  values. Now add a new Data and Statistics Page and plot  $\log x$  and  $\log y$ . Describe this transformation. Describe the form and strength of this relationship. Insert a Calculator Page and press Menu: 5: Statistics, 1: Stat Calculations, 4: Linear Regression ( $a + bx$ ). Include the value of  $r$  to justify your response.

Go to the original scatter plot, press: Menu, 4: Analyze, 6: Regression, 7: Show Power. How does the Power Model fit the data?