Algebra 2 (Honors)

Section 1.3: Scatter Plots and Correlation

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Objectives**:

* Students will be able to graph a scatter plot and identify the data correlation.
* Students will use a graphing calculator to find the correlation coefficient and to make predictions using the line of best fit.

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| **Main Idea** | **Notes** |
| **Do Now:**  **Vocabulary: Scatter Plots**  **Vocabulary: Positive Correlation** | Write down as many examples of real world situations that describe a relationship between two variables. What type of trends, if any, might you see?  (Example to get you started: Your age and height. There is an increasing trend. As your age increase, your height increases)  Examples: Trendscatter plot is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_    Positive Correlation:    Example: |
| **Vocabulary: Negative Correlation**  **Vocabulary: No Correlation** | Negative Correlation:    Example:  No Correlation:    Example: |
| **Example 1: Identifying Linear Relationships** | Which scatterplots below show a linear trend? |
| **Vocabulary: Outlier** | Outlier:  Example: |
| **Vocabulary:**  **Line of Best Fit** | The line of best fit is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  It may go through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  Try to have the same amount of points \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |
| **Example 2:**  **Making a Scatter Plot** | **Plot the data on homework time and TV time on the graph**    Now draw the line of best fit and describe any trends. |
| **Vocabulary:**  **Correlation Coefficient** | A correlation coefficient measures \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  It is called \_\_\_\_\_\_\_\_\_\_\_\_\_.  It describes how close the points in a scatter plot cluster around the  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |
| **Vocabulary: Range of Values for the Correlation Coefficient**  **Vocabulary: Range of Values for the Correlation Coefficient (Continued)** | When all the points fit on the line, r = \_\_\_\_\_\_\_\_\_\_\_\_\_ or r = \_\_\_\_\_\_\_\_\_\_\_\_\_.  When the points are random and no line can be considered, r = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  The closer this number is to 1 or -1, the closer the points are to the  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. |
| **Examples of Different r Values** |  |
| **Example 3: Write the Value of the Correlation Coefficient**  **Vocabulary: Steps for Finding Solutions using Graphing Calculator** | r = . \_\_\_\_\_ \_\_\_\_\_\_ r = . \_\_\_\_\_ \_\_\_\_\_\_     1. Enter the data 2. Graph a scatter plot of the data 3. Find the equation of the graph 4. Graph the regression line on a graph with the scatter plot |
| **Example 4: Scatter Plots and Graphing Calculators** | For seven random summer days, a person recorded the temperature and their water consumption.  That person wants to plan an outdoor party. **Predict** the amount of water a person would drink when the temperature is . |
| **Vocabulary: Steps to graphing a Scatter Plot and the Line of Regression on a Graphing Calculator**  **Vocabulary: Steps to graphing a Scatter Plot and the Line of Regression on a Graphing Calculator (Continued)**  **Example 4 (Continued): Scatter Plots and Graphing Calculators** | Steps:   1. **Enter the Data into Lists:**   \*Press **STAT**  \*Under **EDIT**, Select **1:Edit**  \*Enter x-values (input) into L1  \*Enter y-values (output) into L2  **2. Set up the Scatter Plot**  \*Press **2nd** **Y = (STAT PLOTS)**  \*Select **1: Plot 1**  and hit Enter  \*Move the curser to **On** and hit Enter  \*Move the cursor to **Type** and select the first graph under Type.  \*Under **Xlist** Enter **L1**  \*Under **Ylist** Enter **L2**  \*Under **Mark**: select any of these.  **3. To View Scatter Plot**  \*To plot the points, press **ZOOM** and select **9: ZoomStat**  **4. Finding the regression line:**  \*Press **STAT**  \*Press **CALC**  \*Select **4: LinReg (ax + b)**  \*Press **2nd 1** (For List 1)  \*Press the **Comma** key  \*Press **2nd 2** (For List 2)  \*Press **Enter**  What is the equation of the regression line?  Graph the line of regression in your graphing calculator.  Predict the amount of water a person would drink when the temperature is |
| **Example 5: Making Predictions Using a Line of Best Fit** | Predict the number of CDs that was purchased by a person who is 27 years old. |
| **Homework:** |  |