 **Does seat location matter – Part 2?**



Do students who sit in the front rows do better than students who sit farther away? Mrs. Gallas took a random sample of 30 students from her classes and found these results.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Row | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| Score | 76 | 77 | 94 | 99 | 88 | 90 | 83 | 85 | 74 | 79 | 77 | 79 | 90 | 88 | 68 | 78 | 83 | 79 |
|  |  |  |  |  |  |  |  |  |  |  |  |  | Line of best fit:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Slope: b = SEb = 1.33 |  |  |  |  |  |
| Row | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 |  |  |  |  |  |  |
| Score | 94 | 72 | 101 | 70 | 63 | 76 | 76 | 65 | 67 | 96 | 79 | 96 |  |  |  |  |  |  |

1. If Mrs. Gallas were to take another random assignment of 30 students, do you think the slope of the LSRL would be the same? Why?

2. We are going to construct a 95% confidence interval for the slope of the population regression line. Identify the parameter and statistic.

Parameter:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Statistic:\_\_\_\_\_\_\_\_\_\_\_\_

3. There are five conditions to check.

1. **Linear:** The **scatterplot** needs to show a linear relationship. Also, the **residual plot** doesn’t have a leftover curved pattern. Sketch each at right.
2. **Independent:**
3. **Normal:** A **dotplot of the residuals** cannot show strong skew or outliers. Make one using the applet and sketch it at right.
4. **Equal SD:** The residual plot does not show a clear sideways Christmas tree pattern.
5. **Random:**

4. Construct the interval:

General Formula: Specific Formula:

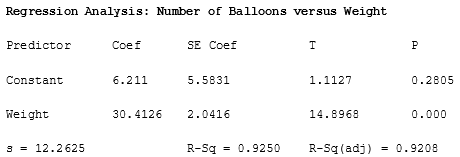
Work:

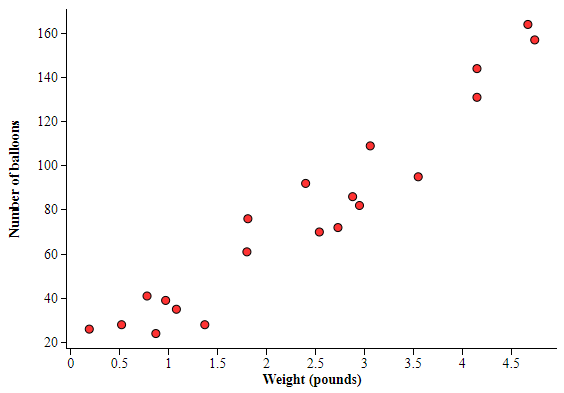
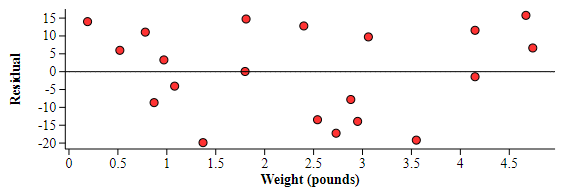
5. Conclude:

Confidence Intervals for Slope

Important ideas:

Check Your Understanding

A thrill-seeker wanted to try to travel across a large field while being suspended in the air by holding onto balloons. In order to determine the number of balloons needed per pound of weight, he did a preliminary study. He selects a random sample of 20 rocks of various sizes. He weighed each one and also determined how many balloons are needed to lift the rock. Here is output from a least-squares regression analysis of the data.

Construct and interpret a 90% confidence interval for the slope of the population regression line.