Statistical Reasoning Name:

Activity 2.2C

In this Activity, you will investigate the effect of Mrs. Liao’s two ideas for adjusting her class’s test scores on the mean, standard deviation, and five-number summary. Here are the data:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 93 | 93 | 87.5 | 91 | 94.5 | 72 | 96 | 95 | 93.5 | 93.5 | 73 | 82 | 45 | 88 |
| 80 | 86 | 85.5 | 87.5 | 81 | 43 | 78 | 86 | 89 | 85 | 82.5 | 88 | 92 | 91 |

**Original Data:**

$Min=\\_\\_\\_\\_\\_\\_\\_$ $Q1=\\_\\_\\_\\_\\_\\_\\_$ $Med=\\_\\_\\_\\_\\_\\_\\_$ $Q3=\\_\\_\\_\\_\\_\\_\\_$ $Max=\\_\\_\\_\\_\\_\\_\\_$

$\overbar{x}=\\_\\_\\_\\_\\_\\_\\_$ $s=\\_\\_\\_\\_\\_\\_\\_$ $Range=\\_\\_\\_\\_\\_\\_\\_$ $IQR=\\_\\_\\_\\_\\_\\_\\_$

**Adding Five Points:**

Now, add five points to each test score. In your calculator, *STAT, ENTER, 🡪 to L2 and then go up and type L1+5 (press 2nd and then 1 to get L1 to show up)*.

Once your data is in, press STAT, 🡪, ENTER and change the list to L2 (press 2nd and then 2 to get L2 to show up).

$Min=\\_\\_\\_\\_\\_\\_\\_$ $Q1=\\_\\_\\_\\_\\_\\_\\_$ $Med=\\_\\_\\_\\_\\_\\_\\_$ $Q3=\\_\\_\\_\\_\\_\\_\\_$ $Max=\\_\\_\\_\\_\\_\\_\\_$

$\overbar{x}=\\_\\_\\_\\_\\_\\_\\_$ $s=\\_\\_\\_\\_\\_\\_\\_$ $Range=\\_\\_\\_\\_\\_\\_\\_$ $IQR=\\_\\_\\_\\_\\_\\_\\_$

**Doubling Each Score (Multiplying by 2):**

Now, double each score. In your calculator, *STAT, ENTER, 🡪 to L3 and then go up and type L1\*2*.

Once your data is in, press STAT, 🡪, ENTER and change the list to L3 (press 2nd and then 3 to get L3 to show up).

$Min=\\_\\_\\_\\_\\_\\_\\_$ $Q1=\\_\\_\\_\\_\\_\\_\\_$ $Med=\\_\\_\\_\\_\\_\\_\\_$ $Q3=\\_\\_\\_\\_\\_\\_\\_$ $Max=\\_\\_\\_\\_\\_\\_\\_$

$\overbar{x}=\\_\\_\\_\\_\\_\\_\\_$ $s=\\_\\_\\_\\_\\_\\_\\_$ $Range=\\_\\_\\_\\_\\_\\_\\_$ $IQR=\\_\\_\\_\\_\\_\\_\\_$

**Removing Outliers:**

In L4, enter the original test scores, but remove the two scores that are probably outliers. You don’t have to calculate if they are outliers, just look at the data and pick the two that are most likely outliers.

Once your data is in, press STAT, 🡪, ENTER and change the list to L4.

$Min=\\_\\_\\_\\_\\_\\_\\_$ $Q1=\\_\\_\\_\\_\\_\\_\\_$ $Med=\\_\\_\\_\\_\\_\\_\\_$ $Q3=\\_\\_\\_\\_\\_\\_\\_$ $Max=\\_\\_\\_\\_\\_\\_\\_$

$\overbar{x}=\\_\\_\\_\\_\\_\\_\\_$ $s=\\_\\_\\_\\_\\_\\_\\_$ $Range=\\_\\_\\_\\_\\_\\_\\_$ $IQR=\\_\\_\\_\\_\\_\\_\\_$

**Summary:**

1) Compare the statistics of your original data with the statistics of the data when you added five points. What do you notice?

 What changed?

 How did it change?

 What stayed the same?

2) Compare the statistics of your original data with the statistics of the data when you doubled the scores. What do you notice?

 What changed?

 How did it change?

 What stayed the same?

3) Compare the statistics of your original data with the statistics of the data when you removed the outliers. What do you notice?

 What changed?

 How did it change?

 What stayed the same?

4) Make four histograms (one for the original data, one for the data that had five points added, one with the score doubled, and one for the data without outliers) each with a bar width of 5. *(See back for tables and axes)*

Describe the shape of each histogram.

 Original Data:

 Five Points Added:

 Scores Doubled:

 Outliers Removed:

**Original Data: (L1) Five Points Added: (L2)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Score** | **Frequency** |  | **Score** | **Frequency** |
| 40 - < 47 |  |  | 40 - < 47 |  |
| 47 - < 54 |  |  | 47 - < 54 |  |
| 54 - < 61 |  |  | 54 - < 61 |  |
| 61 - < 68 |  |  | 61 - < 68 |  |
| 68 - < 75 |  |  | 68 - < 75 |  |
| 75 - < 82 |  |  | 75 - < 82 |  |
| 82 - < 89 |  |  | 82 - < 89 |  |
| 89 - < 96 |  |  | 89 - < 96 |  |
| 96 - < 103 |  |  | 96 - < 103 |  |

 

**Score Doubled: (L3) Outlier Removed: (L4)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Score** | **Frequency** |  | **Score** | **Frequency** |
| 80 - < 87 |  |  | 40 - < 47 |  |
| 87 - < 108 |  |  | 47 - < 54 |  |
| 108 - < 122 |  |  | 54 - < 61 |  |
| 122 - < 136 |  |  | 61 - < 68 |  |
| 136 - < 150 |  |  | 68 - < 75 |  |
| 150 - < 164 |  |  | 75 - < 82 |  |
| 164 - < 178 |  |  | 82 - < 89 |  |
| 178 - < 192 |  |  | 89 - < 96 |  |
| 192 - < 206 |  |  | 96 - < 103 |  |

 