CHOOSE number 1 **OR** number 2 and answer all parts, a – d, of your choice.

1. **Flower lengths for the H. CARIBAEA YELLOW Heliconia are listed below.   
   Answer parts a – d below.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 36.78 | 37.02 | 36.52 | 36.11 | 36.03 | 35.45 | 38.13 | 37.10 |
| 35.17 | 36.82 | 36.66 | 35.68 | 36.03 | 34.57 | 34.63 |  |

* 1. Find the 5-number summary for this data. (5 points)
  2. Are there any outliers? Which data points, if any, are outliers? (5 points)
  3. Calculate the mean **AND** sample standard deviation of this data. (5 points)
     1. mean: 35.86; standard deviation: 0.9753
     2. mean: 36.18; standard deviation: 0.9753
     3. mean: 36.18; standard deviation: 0.8004
     4. mean: 35.86; standard deviation: 0.8004
  4. Draw a stem plot, histogram, **OR** box plot to illustrate the distribution. (5 points)

1. **Do beavers benefit beetles? Answer parts a – d below.**

Researchers laid out 23 circular plots, each four meters in diameter, in an area where beavers were cutting down cottonwood trees. In each plot, they counted the number of stumps from trees cut by beavers and the number of clusters of beetle larvae. Ecologists think that the new sprouts from stumps are tenderer than other cottonwood growth, so that beetles prefer them. If so, more stumps should result in more beetle larvae. The following table contains the data for 12 randomly selected circular plots. Analyze these data to see if they support the “beavers benefit beetles” idea.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Stumps** | 1 | 3 | 1 | 2 | 3 | 1 | 2 | 1 | 4 | 1 | 2 | 4 |
| **Beetle Larvae** | 12 | 43 | 11 | 27 | 40 | 8 | 14 | 16 | 54 | 9 | 13 | 50 |

|  |  |
| --- | --- |
| Stumps MEAN | 2.08 |
| Stumps STANDARD DEVIATION | 1.16 |
| Larvae MEAN | 24.75 |
| Larvae STANDARD DEVIATION | 17.25 |

* 1. What is the correlation between the number of stumps and clusters of beetle larvae? Use your calculator to find the exact value. (5 points)
  2. 0.92
  3. 0.95
  4. 0.97

1. Find the least-squares regression line. Show your work. (5 points)
2. What does the slope tell you? (5 points)
3. If there are 2 stumps in the circular plot, on average, how many beetle larvae can you expect? Use the least-squares regression line. (5 points)