



Solutions

Algebra II Journal
Module 3: Standard Deviation
Plinko

This journal belongs to:

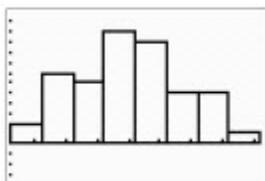
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Algebra II Journal: Reflection 2

Respond to the following reflection questions and submit to your teacher.

Construct a histogram for the Vice Presidents of the United States data.

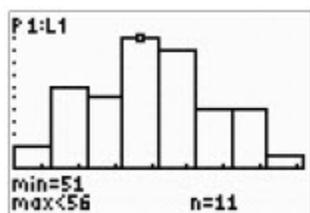
Answer:



Calculate the mean and standard deviation for the vice presidents' ages at inauguration. Use what you know about mean (μ) and standard deviation (σ) and data distributions to justify why the ages of the vice presidents form a normal distribution.

Answer:

The mean age of the vice presidents is 54.26, with a standard deviation of 8.45. The mean falls approximately in the middle of the distribution, which can be found by tracing the histogram (as shown below).



The bars of the histogram are generally symmetric about the mean, with no extreme values to pull the mean from the middle of the data. Thus, this appears to be a normal distribution.

What percentage of the ages is within one standard deviation of the mean (-1σ and $+1\sigma$)? What is this range of ages?

Answer:

28 out of the 47 vice presidents' ages fall in the range of 45.81 and 62.71 years old. This is 59.57% of the data, which follows the 68-95-99.7 Rule very closely.

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How close does the data fit the 95.44% rule, where 95.44% of the data falls within two standard deviations of the mean $(\mu \pm 2\sigma)$? How close does the data fit the 99.74% rule, where 99.74% of the data falls within three standard deviations of the mean $(\mu \pm 3\sigma)$?

Answer:

46 out of the 47 vice presidents ages fall in the range of 37.36 and 71.16 years old. This is 97.87% of the data. 47 out of the 47 vice presidents ages fall in the range of 28.91 and 79.61 years old. This is 100% of the data. The ages of the vice presidents follows the 68-95-99.7 Rule almost precisely!

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Algebra II Journal: Reflection 3

In this lesson, you explored normal distributions and compared them to skewed distributions. You discovered population percentages under the normal curve.

Respond to the following reflection question and submit to your teacher.

In the presidential data for “Number of Years Served,” the distribution of the data turned out to be skewed to the right. What would happen to the distribution if Theodore Roosevelt was removed from the data? Use what you have learned about mean, standard deviation, normal distributions and the 68-95-99.7 Rule to justify your answer.

Answer:

Answers will vary. Sample answer: President Theodore Roosevelt was the only president to serve more than 2 terms, serving 4 terms. His term is an outlier in the data, pulling the mean high. If his data point were removed, the mean would decrease to be most likely closer to 6 (the average of 4 years and 8 years). The standard deviation would also decrease, because the data is tighter around the 1- and 2-term presidents. There may be some slight skewing to the left now, because President Garfield and President Harrison are extremely low values and are no longer balanced out by the extreme high value of President Roosevelt.