

Standard Deviation Practice with No Z-Scores

1. If 13.6% of a set of data above the mean is between the values 86.5 and 89 then the mean and standard deviation are
- A) The mean is 82 and the standard deviation is 2.5.
 - B) The mean is 84 and the standard deviation is 2.5.
 - C) The mean is 82 and the standard deviation is 3.5.
 - D) The mean is 84 and the standard deviation is 3.5.
2. Given a mean of 125 and a standard deviation of 3, the 95.4% of the data is between
- A) 125 and 128
 - B) 122 and 125
 - C) 119 and 128
 - D) 119 and 131

Use the following information to answer the next question.

There were 276 students who wrote a University Biology final exam. The marks were normally distributed with a mean of 62% and a standard deviation of 6%. Consider the following statements.

Statement 1	There were 138 students who scored less than 62%.
Statement 2	Scoring less than 68%, was about 84% of the students.
Statement 3	There were 28 students who scored higher than 74%.
Statement 4	There were 64 students scoring less than 56%.

3. The two true statements are
- A) 1 and 2
 - B) 3 and 4
 - C) 1 and 3
 - D) 2 and 4

Use the following information to answer the next question.

An electronics company tested a random sample of 120 batteries used in the products they sell. It was determined that 68.3% of the batteries lasted between 124 hours and 166 hours.

4. Based on this data, virtually all of the batteries, or 99.7%, will last between 82 hours and ____ hours.

Use the following information to answer the next question.

Jennifer is a software engineer and is applying for a job that pays a mean salary of \$165 000 with a standard deviation of \$18 000.

5. Jennifer claims that, if she gets hired, she will have an 80% chance of getting a salary between \$147 000 and \$183 000. Do you agree with her? Explain.

6. Adult male whistle pigs have weights that are normally distributed with a mean of 3.83 kg and a standard deviation of 0.8 kg. From a random sample of 75 whistle pigs, the expected number to have weights between 2.23 and 4.63 kg is

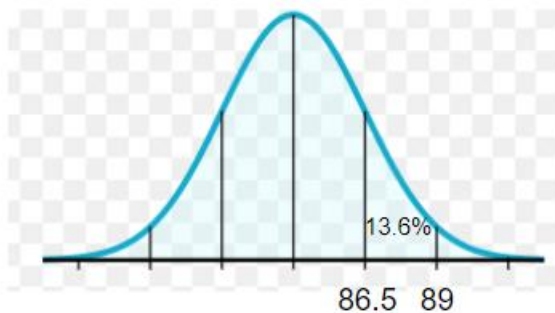
A) 51 B) 58 C) 61 D) 68

Standard Deviation Practice with No Z-Scores Solutions

1. If 13.6% of a set of data above the mean is between the values 86.5 and 89 then the mean and standard deviation are
- A) The mean is 82 and the standard deviation is 2.5.
 - B) The mean is 84 and the standard deviation is 2.5.**
 - C) The mean is 82 and the standard deviation is 3.5.
 - D) The mean is 84 and the standard deviation is 3.5.

Solution

There is 13.6% of the data between 1 and 2 standard deviations from the mean.

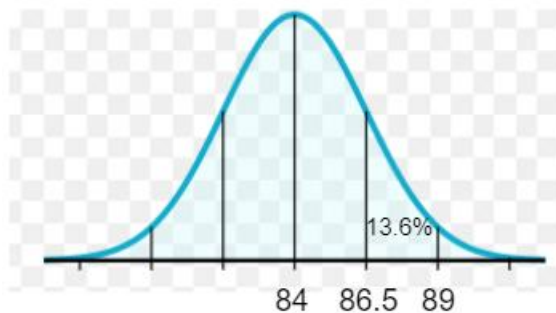


The difference between these two values is the standard deviation.

$$89 - 86.5 = 2.5$$

Subtract 2.5 from 86.5 to arrive at the mean.

$$86.5 - 2.5 = 84$$



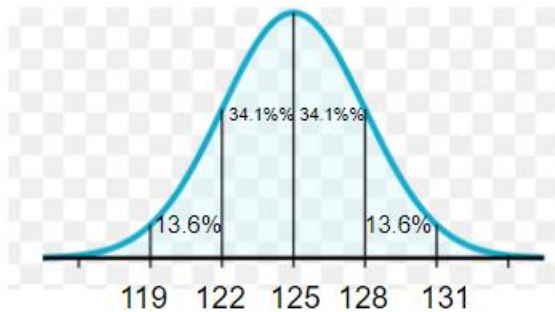
The correct answer is B.

2. Given a mean of 125 and a standard deviation of 3, the 95.4% of the data is between

- A) 125 and 128
- B) 122 and 125
- C) 119 and 128
- D) 119 and 131

Solution

There is 95.4% of the data within 2 standard deviations of the mean.



The correct answer is D.

Use the following information to answer the next question.

There were 276 students who wrote a University Biology final exam. The marks were normally distributed with a mean of 62% and a standard deviation of 6%. Consider the following statements.

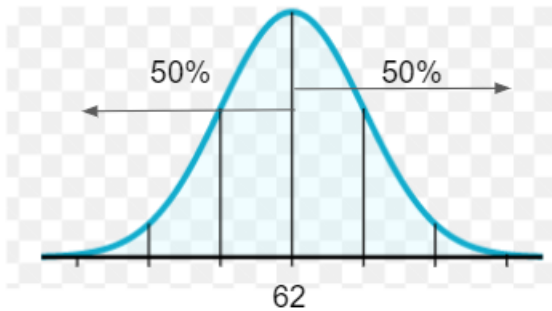
Statement 1	There were 138 students who scored less than 62%.
Statement 2	Scoring less than 68%, was about 84% of the students.
Statement 3	There were 28 students who scored higher than 74%.
Statement 4	There were 64 students scoring less than 56%.

3. The two true statements are

- A) 1 and 2
- B) 3 and 4
- C) 1 and 3
- D) 2 and 4

Solution

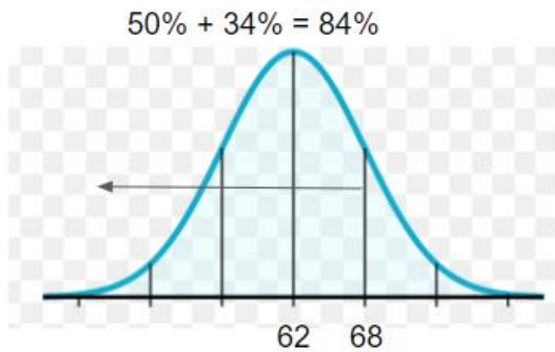
Statement 1



$(276) (0.5) = 138$
There were 138 who scored greater than 62 and 138 who scored less than 62.

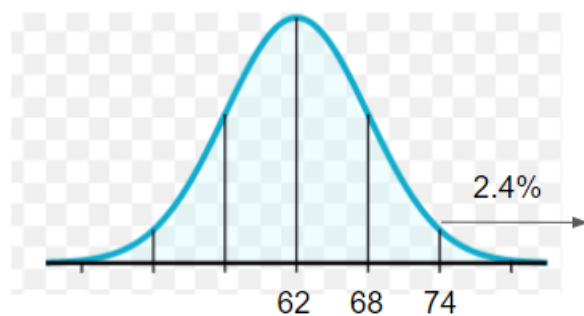
Statement 1 is true.

Statement 2



Statement 2 is true.

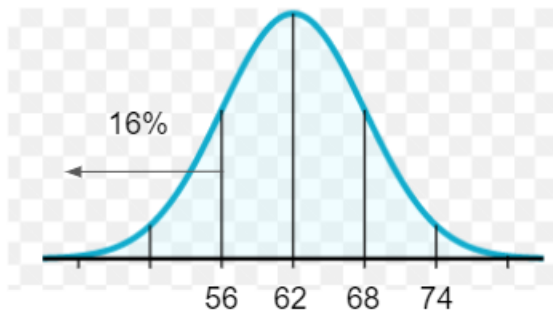
Statement 3



The data value of 74 represents 2 standard deviations above the mean. There is about 2.4% of the data to the right.
To find the number of students, multiply the total of 276 by (0.024), which is 6.6 or 7.

Statement 3 is false.

Statement 4



The data value of 56 represents 1 standard deviation below the mean. There is about 16% of the data to the left.

To find the number of students, multiply the total of 276 by (0.16), which is 44.16 or 44..

Statement 4 is false.

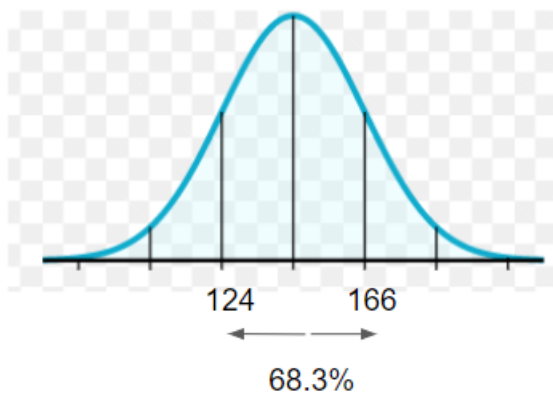
The correct answer is A.

Use the following information to answer the next question.

An electronics company tested a random sample of 120 batteries used in the products they sell. It was determined that 68.3% of the batteries lasted between 124 hours and 166 hours.

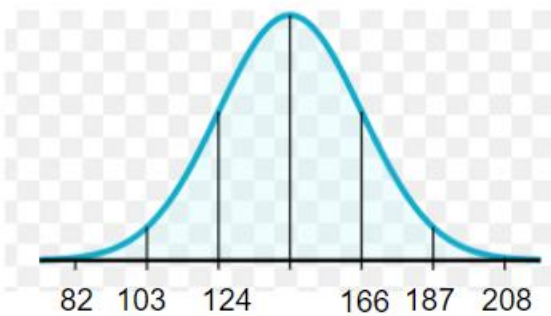
4. Based on this data, virtually all the batteries, or 99.7%, will last between 82 hours and 208 hours.

Solution



Half-way between 124 and 166 is the mean. The mean is 145. The difference between the mean and either data value is the standard deviation. The standard deviation is 21.

Now continue to add data values with a standard deviation of 21.



Virtually all of the data is within 3 standard deviations of the mean. In this example, the data values representing 3 standard deviations within the mean are 82 and 208.

Based on this data, virtually all of the batteries, or 99.7%, will last between 82 hours and 208 hours.

Use the following information to answer the next question.

Jennifer is a software engineer and is applying for a job that pays a mean salary of \$165 000 with a standard deviation of \$18 000.

5. Jennifer claims that, if she gets hired, she will have an 80% chance of getting a salary between \$147 000 and \$183 000. Do you agree with her? Explain.

Solution

When the standard deviation of \$18 000 is added and subtracted from the mean, the data values representing 1 standard deviation above and below the mean are \$147 000 and \$183 000. Between these two data values, in other words, within 1 standard deviation of the mean, there is about 68% of the data.

I disagree with Jennifer as her chance is not 80%, but rather 68%.

6. Adult male whistle pigs have weights that are normally distributed with a mean of 3.83 kg and a standard deviation of 0.8 kg. From a random sample of 75 whistle pigs, the expected number to have weights between 2.23 and 4.63 kg is

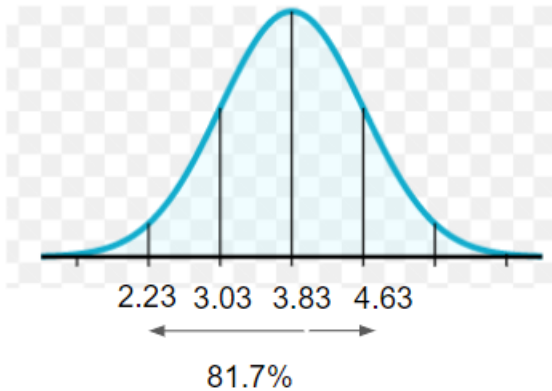
A) 51

B) 58

C) 61

D) 68

Solution



The percentage between the two data values is 81.7%. Multiply this number as a decimal by the sample total of 75. $(0.817)(75) = 61.275$, or 61.

The correct answer is C.