

Topic: Changing the data and outliers

Question: A company measures the width of its copper tubing in inches. The mean diameter of a tube is $\frac{1}{8}$ of an inch. They want to change the measurement to centimeters for shipment overseas. Given $1 \text{ in} = 2.54 \text{ cm}$, how does the conversion affect the mean diameter?

Answer choices:

- A The new mean is $(\frac{1}{8}) + 2.54$ centimeters.
- B The new mean is $(\frac{1}{8})(2.54)$ centimeters.
- C The new mean is $(\frac{1}{8}) \div (2.54)$ centimeters.
- D The mean remains the same.



Solution: B

To convert the inches to centimeters, you need to multiply. Scaling a data set by multiplying changes the mean by the same factor.



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Question: The IQR of a data set is 57. How will subtracting 5 from each data point in the data set affect the IQR?

Answer choices:

- A The IQR will increase by 5.
- B The IQR will decrease by 5.
- C The IQR will be divided by 5.
- D The IQR will stay the same.



Solution: D

Subtracting a constant (like 5) from each data point in a data set will have no effect on the IQR.



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Question: The students in an English class ended up with a mean score on their recent exam of 65 points. The range of the scores was 25 points. If each score is increased by 5 points, what are the new mean and range?

Answer choices:

- A The new mean is 65; the new range is 25
- B The new mean is 65; the new range is 30
- C The new mean is 70; the new range is 25
- D The new mean is 70; the new range is 30



Solution: C

Adding 5 points to all of the exam scores increases all of the scores by 5 points, but the distances between the exam scores remain the same. That is why the mean increases by 5 but the range stays the same.

The original mean is 65 and the new mean is $65 + 5 = 70$. The original range is 25 and the new range is 25.

