

Lesson 4 Outliers and Trimmed Mean

Monday, October 24, 2022 2:26 PM



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Outlier: A value that is much larger or smaller than the other values of data. There could be 0, 1 or multiple outliers in a set of data.

Recalculated Mean: An average of a set of data that is found after removing the outlier(s).

Trimmed Mean: An average of a set of data that is found after removing the highest and lowest values. The same number of values must be removed from the top and bottom of the data.

Example 1

Determine the range and identify any outlier(s) in each set of data.

a.) ~~7, 9, 12, 8, 11, 1, 10, 9~~

1, 7, 8, 9, 9, 10, 11, 12

$$\begin{aligned} \text{Range} &= \text{highest} - \text{lowest} \\ &= 12 - 1 \\ &= 11 \end{aligned}$$

outlier 1

b.) ~~20, 34, 20, 15, 3, 20, 6, 10, 13, 1, 10, 50, 21~~

1, 3, 6, 10, 10, 13, 15, 20, 20, 20, 21, 34, 50

$$\begin{aligned} \text{Range} &= 50 - 1 \\ &= 49 \end{aligned}$$

outliers
1, 3, 6, 34, 50

Example 2

a.) Determine the recalculated mean of the data.

↳ remove outliers

$$-16, -11, -7, -29, -31, -18, -21, 18$$

$$-31, -29, -21, -18, -16, -11, -7, 18$$

outlier 18

$$\text{recalculated mean} = \frac{-31 + (-29) + (-21) + (-18) + (-16) + (-11) + (-7)}{7}$$

$$= \frac{-133}{7}$$

$$= -19$$

b.) Determine the trimmed mean of the data.

↳ remove an equal number of values from top and bottom of the data

$$\text{trimmed mean} = \frac{-29 + (-21) + (-18) + (-16) + (-11) + (-7)}{6}$$

$$= \frac{-102}{6}$$

$$= -17$$

Example 2

Judges in a gymnastics competition gave the following scores to competitors.

$$\cancel{8.5}, \cancel{9.0}, \cancel{6.9}, \cancel{7.5}, \cancel{7.0}, \cancel{9.5}, 10.0, \cancel{5.0}, \cancel{8.0}, \cancel{8.0}, \cancel{7.5}, \cancel{7.5}, \cancel{6.8}, \cancel{6.8}$$

$$5.0, 6.8, 6.8, 6.9, 7.0, 7.5, 7.5, 7.5, 8.0, 8.0, 8.5, 9.0, 9.5, 10.0$$

a.) Determine the range.

$$10.0 - 5.0$$

$$5.0$$

b.) Identify any outlier(s).

5.0, 10.0

c.) Determine the trimmed mean of the data.

$$\frac{93}{12}$$

7.75

* close to median of 7.5