Mean Absolute Deviation Worksheet Questions and Answers PDF

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Part 1: Building a Foundation

What does Mean Absolute Deviation (MAD) measure in a data set?

Hint: Think about what MAD represents in terms of data points.

- ◯ A) The sum of all data points
- ◯ **B) The average distance between each data point and the mean ✓**
- ◯ C) The highest value in the data set
- ◯ D) The lowest value in the data set

> MAD measures the average distance between each data point and the mean.

Which of the following are steps in calculating the Mean Absolute Deviation?

Hint: Consider the process of finding deviations and averaging them.

- ☐ **A) Find the mean of the data set ✓**
- ☐ B) Square each data point
- ☐ **C) Calculate the absolute deviation of each data point ✓**
- ☐ **D) Average the absolute deviations ✓**

> The steps include finding the mean, calculating absolute deviations, and averaging them.

Explain why the Mean Absolute Deviation is considered less sensitive to outliers compared to standard deviation.

Hint: Think about how deviations are calculated in both measures.

MAD is less sensitive to outliers because it uses absolute values, which do not square the deviations, thus reducing the impact of extreme values.

List the four main steps involved in calculating the Mean Absolute Deviation.

Hint: Think about the sequence of actions taken to find MAD.

1. Step 1

Find the mean of the data set.

2. Step 2

Calculate the deviation of each data point from the mean.

3. Step 3

Take the absolute value of each deviation.

4. Step 4

Average the absolute deviations.

> The four main steps are: find the mean, calculate deviations, take absolute values, and average the absolute deviations.

Part 2: Comprehension and Application

Why is the absolute value used in calculating MAD?

Hint: Consider the effect of negative values on the calculation.

- ◯ A) To simplify the calculation
- ◯ **B) To ensure all deviations are positive ✓**
- ◯ C) To ignore the mean
- ◯ D) To increase the variability

> The absolute value is used to ensure all deviations are positive, allowing for a meaningful average.

In which scenarios would MAD be a more appropriate measure than standard deviation?

Hint: Think about the characteristics of the data sets.

- ☐ **A) When data contains outliers ✓**
- ☐ B) When comparing two data sets with similar variances
- ☐ **C) When a quick estimate of variability is needed ✓**
- ☐ D) When data is normally distributed

> MAD is more appropriate when data contains outliers or when a quick estimate of variability is needed.

Given the data set [3, 7, 7, 2, 9], what is the Mean Absolute Deviation?

Hint: Calculate the mean and then find the absolute deviations.

- ◯ **A) 2 ✓**
- ◯ B) 3
- ◯ C) 4
- ◯ D) 5

> The Mean Absolute Deviation for the data set is 2.

Calculate the Mean Absolute Deviation for the data set [4, 8, 6, 5, 10]. Show your work.

Hint: Make sure to detail each step of your calculation.

To find MAD, calculate the mean, find deviations, take absolute values, and average them.

Part 3: Analysis, Evaluation, and Creation

How does the Mean Absolute Deviation help in comparing the variability of two different data sets?

Hint: Consider what MAD represents in terms of data spread.

- ◯ A) By providing the sum of deviations
- ◯ **B) By showing the average deviation from the mean ✓**
- ◯ C) By indicating the range of data
- ◯ D) By calculating the median

MAD helps compare variability by showing the average deviation from the mean for each data set.

Analyze how the Mean Absolute Deviation would change if a data point significantly higher than the rest is added to the data set.

Hint: Think about the impact of outliers on the calculation.

Adding a significantly higher data point would increase the average deviation, thus raising the MAD.

Which measure would you recommend for analyzing a data set with significant outliers, and why?

Hint: Consider the sensitivity of different measures to outliers.

- ◯ **A) Mean Absolute Deviation ✓**
- ◯ B) Standard Deviation
- ◯ C) VariANCE
- ◯ D) Range

> Mean Absolute Deviation is recommended because it is less affected by outliers compared to standard deviation.

Design a simple experiment or study where Mean Absolute Deviation could be used to analyze the results. Describe the data you would collect and how MAD would help interpret the findings.

Hint: Think about a scenario where variability is important.

> **An example could be measuring the heights of plants under different conditions, where MAD helps understand the consistency of growth.**