Answers

Outliers Worksheet

1. Find the outlier(s) of the data set. 43, 69, 49, 78, 88, 54, 73, (194), 54, 59, 70, (2)

2. Find the outlier(s) of the data set. 40, 62, 47, 68, (12), 78, 49, 65, 49, 52, 63, (3)

3. Find the outlier of the data set. 44, 67, 52, 72, 82, 55, 70, (200), 55, 57, 68

4. The following table gives the math scores of 10 friends:

Name	Math score (%)
Albert	46
Beth	29
Cindy	35
David	93
Emily	37
Frank	38
Gary	45
Helen	44
Ida	46
Jeremy	31

← outlier

If the score of the outlier is not included, what is the mean score?

$= (46 + 29 + 35 + 37 + 38 + 45 + 44 + 46 + 31) \div 9$

$= 39\%$

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5. The temperatures (in °F) recorded in Saskatoon at noon on each day for two weeks were as follows:

81, 78, 77, 75, 80, 82, 84, 78, 74, 75, 49 (outlier), 71, 76, 80

If the outlier is excluded, what was the mean temperature?

$= (81 + 78 + 77 + 75 + 80 + 82 + 84 + 78 + 74 + 75 + 71 + 76 + 80) \div 13$

$= 77.8°F$

6. Miss Jones has 30 students in her math class.
In the recent exam, her students averaged 67%.
But Miss Jones told Principal Schultz that her students had averaged 71%.

In order to impress Principal Schultz, Miss Jones had excluded the two outliers in her class who had scored very low marks.

What was the mean mark of those two poor students?

$30 \times 67 = 2010$ marks total

$28 \times 71 = 1988$ marks with the outliers missing

$2010 - 1988 = 22$ marks for the two outliers

$22 \div 2 = 11\%$ average for the two outliers

7. 50 children guessed the number of marbles in a jar and the average guess was 627.
However three of the guesses were way too high and so were excluded from the competition.
When these three outliers were excluded, the average guess was reduced by 114.

What was the mean of the three outliers?

$627 - 114 = 513$

$50 \times 627 = 31,350$ marbles total

$47 \times 513 = 24,111$ marbles (no outlier guesses)

$31,350 - 24,111 = 7239$ (total for outliers)

$7239 \div 3 = 2413$ (mean for outlier guesses).

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8. Given the following data: 164, 175, 126, 135, 159, 143, 55

   a. What effect will the outlier have on the median of the data if the outlier is excluded?

   55, 126, 135, 143, 159, 164, 175

   - the median will increase from 143 to 151

   b. What effect will the outlier have on the mean of the data if the outlier is excluded?

   - the mean will increase from 136.7 to 150.3

   c. What effect will the outlier have on the mode of the data if the outlier is excluded?

   - No change, each number only occurs once.

   d. What effect will the outlier have on the range of the data if the outlier is excluded?

   - the range will decrease from 120 to 49.

9. If Miguel earned the following test scores 89, 92, 86, and 97, his average (mean) test score would be 91. The teacher entered his scores in as 89, 92, 68 and 97.

   a. How is his mean going to change?

   $(89+92+68+97) \div 4 = 86.5$

   - his average will decrease by 4.5%

   b. If he were to not turn in a take home test and got a 0, how would his average change?

   $(89+92+86+97+0) \div 5 = 72.8$

   - his average would decrease by 18.2%

10. The grade 9 class has an average height of 5 feet 9 inches. A new student joins the class and brings the average down to 5 feet 4 inches. Should you exclude the new student from the calculation? Explain your answer.

No, we are trying to calculate the class average in height and the student is now a part of the class