

Mathematics
Open Response
Grade 8

MATH CLUB ATTENDANCE

The number of students who attended math club for each meeting last school year are listed.

33, 37, 12, 47, 29, 42, 51, 32, 35, 44

- A. Explain how to find the mean of the data. Then find the mean.
- B. Explain how to find the median of the data. Then find the median.
- C. Explain why the data has no mode.
- D. Explain how to find the range of the data. Then find the range.
- E. Find the upper and lower quartiles and the interquartile range of the data.
- F. Explain how to identify outliers in a set of data. Then identify any outliers.
- G. Draw a box-and-whisker plot of the data.

Mathematics
Open Response
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Core Content: MA-M-3.1.1, 3.1.2, 3.1.3, 3.2.1, 3.2.2, 3.2.3

MATH CLUB ATTENDANCE

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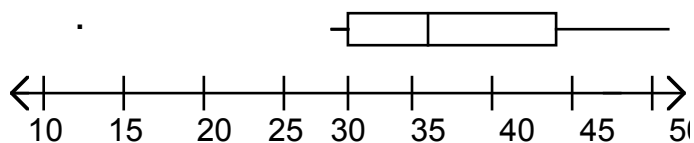
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SAMPLE LEVEL 4 RESPONSE
MATH CLUB ATTENDANCE

- A. To find the mean add the number of students that attended each meeting, and then divide by 10.
 $(12 + 29 + 32 + 33 + 35 + 37 + 42 + 44 + 47 + 51)/10 = 362/10 = 36.2$
- B. To find the median order the data from least to greatest and then find the mean of the middle two values.
 $(35 + 37)/2 = 72/2 = 36$
- C. The data has no mode because no data value appears more often than any other data value. Mode means most often occurring data value in the set.
- D. To find the range subtract the smallest data value from the greatest data value.
 $51 - 12 = 39$
- E. UQ = 44
LQ = 32
IQR = 12
- F. Outliers are data values that are below the lower limit or above the upper limit. To find the lower limit take the lower quartile and subtract 1.5 times the interquartile range. To find the upper limit take the upper quartile and add 1.5 times the interquartile range.
Lower limit = $32 - 1.5(12) = 14$
Upper limit = $44 + 1.5(12) = 62$
The only outlier is 12. It is below the lower limit of 14. There is no data value greater than the upper limit of 62.

G.



SCORING GUIDE
MATH CLUB ATTENDANCE

SCORE	DESCRIPTION
4	Response earns a total of 6.5 points.
3	Response earns 5 - 6 points.
2	Response earns 2.5 - 4.5 points.
1	Response earns 0.5 - 2 points.
0	Response is incorrect or irrelevant.
BLANK	No response.

- A. 0.5 point correct explanation of mean
0.5 point mean = 36.2
- B. 0.5 point correct explanation of median
0.5 point median = 36
- C. 0.5 point correct explanation of why data has no mode
- D. 0.5 point correct explanation of range
0.5 point range = 39
- E. 0.5 point UQ = 44 and LQ = 32
0.5 point IQR = 12
- F. 0.5 point correct explanation of how to identify outliers in a set of data
0.5 point outlier = 12
- G. 1 point all parts of plot correct
0.5 point 1 part of plot incorrect