Quiz: Mean, Quartiles, Range and Interquartile Range

Section:Statistics(3)

Sub-section: Mean, Quartiles, Range and Interquartile Range

Choose the correct answer.

1. The weights (in kilograms) of 5 people are:

   40, 42, 40, 45, 43

   What is the average weight of 5 people? (understand, MA 3.1 G.9/1)

   A. 40 kilograms

   B. 41 kilograms

   C. 42 kilograms

   D. 43 kilograms

   Solution 42 kilograms

   42 kilograms because Mean $= \frac{40 + 42 + 40 + 45 + 43}{5}$

   So, Mean $=$ 42 kilograms

   Thus, the average weight of 5 people is 42 kilograms.

2. The weights (in kilograms) of 5 people are:

   50, 53, 55, 52, 50

   What is the average weight of 5 people? (understand, MA 3.1 G.9/1)

   A. 51 kilograms

   B. 52 kilograms

   C. 53 kilograms

   D. 54 kilograms

   Solution 52 kilograms

   52 kilograms because Mean $= \frac{50 + 53 + 55 + 52 + 50}{5}$

   So, Mean $=$ 52 kilograms

   Thus, the average weight of 5 people is 52 kilograms.

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3. Martin receives the following scores on his math tests: 68, 96, 80, 86. What score does he need on the next test in order to have an average of 85 on his math tests? (apply, MA 3.1 G.9/1)

   A. 85

   B. 88

   C. 92

   D. 95

   Solution 95

   Let x is the next test score

   $85 = \frac{68 + 96 + 80 + 86 + x}{5}$

   $425 = 330 + x$

   So, $x = 95$

   Thus, he needs a 95 score on the next test.

4. Mary receives the following scores on her math tests: 86, 95, 90, 88. What score does she need on the next test in order to have an average of 90 on her math tests? (apply, MA 3.1 G.9/1)

   A. 91

   B. 92

   C. 93

   D. 94

   Solution 91

   Let x is the next test score

   $90 = \frac{86 + 95 + 90 + 88 + x}{5}$

   $450 = 359 + x$

   So, $x = 91$

   Thus, she needs a 91 score on the next test.

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5. Find the 1^{st} and 3^{rd} quartiles of this data set:

4 9 3 8 12 6 10 5 14

(understand, MA 3.1 G.9/1)

A. $Q_1 = 4.5 \; and \; Q_3 = 10.5$

B. $Q_1 = 4.5 \; and \; Q_3 = 11$

C. $Q_1 = 5.5 \; and \; Q_3 = 10.5$

D. $Q_1 = 5.5 \; and \; Q_3 = 11$

Solution $Q_1 = 4.5 \; and \; Q_3 = 11$

Sort from lowest to highest:

3 4 5 6 8 9 10 12 14 $(N = 9)$

Find the first quartile,

$$Q_1 \, position = \frac{1}{4}(9 + 1) = 2.5$$

So, $Q_1 = 4 + (0.5)(5 - 4) = 4.5$

Find the third quartile,

$$Q_3 \, position = \frac{3}{4}(9 + 1) = 7.5$$

So, $Q_3 = 10 + (0.5)(12 - 10) = 11$

Thus, $Q_1 = 4.5 \; and \; Q_3 = 11$

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6. Find the 1^{st} and 3^{rd} quartiles of this data set:

3 7 6 10 15 13 9 12 14

(understand, MA 3.1 G.9/1)

A. $Q_1 = 6.25 \; and \; Q_3 = 13$

B. $Q_1 = 6.25 \; and \; Q_3 = 13.5$

C. $Q_1 = 6.5 \; and \; Q_3 = 13$

D. $Q_1 = 6.5 \; and \; Q_3 = 13.5$

Solution $Q_1 = 6.5 \; and \; Q_3 = 13.5$

Sort from lowest to highest:

3 6 7 9 10 12 13 14 15 $(N = 9)$

Find the first quartile,

$$Q_1 \; position = \frac{1}{4}(9 + 1) = 2.5$$

So, $Q_1 = 6 + (0.5)(7 - 6) = 6.5$

Find the third quartile,

$$Q_3 \; position = \frac{3}{4}(9 + 1) = 7.5$$

So, $Q_3 = 13 + (0.5)(14 - 13) = 13.5$

Thus, $Q_1 = 6.5 \; and \; Q_3 = 13.5$

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7. 44 65 54 38 32 24 27 49 50 21

Given the data set above, what is the range of this data set?

(understand, MA 3.1 G.9/1)

A. 40

B. 42

C. 44

D. 46

Solution 44

Minimum = 21

Maximum = 65

Thus, the range of this data set is $Max - Min = 65 - 21 = 44$.

8. 34 66 58 28 42 44 37 67 55 49

Given the data set above, what is the range of this data set?

(understand, MA 3.1 G.9/1)

A. 38

B. 39

C. 40

D. 41

Solution 39

Minimum = 28

Maximum = 67

Thus, the range of this data set is $Max - Min = 67 - 28 = 39$.

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9. Find the interquartile range of this data set:

   49 53 56 64 74 78 66 58 68 76 85

   (understand, MA 3.1 G.9/1)

   A. 18

   B. 20

   C. 22

   D. 24

   Solution 20

   Sort from lowest to highest: 49 53 56 58 64 66 68 74 76 78 85

   $Q_1\ position\ = \frac{1}{4}(11\ +\ 1)\ =\ 3$, then $Q_1\ =\ 56$

   $Q_3\ position\ = \frac{3}{4}(11\ +\ 1)\ =\ 9$, then $Q_3\ =\ 76$

   $IQR\ =\ Q_3 - Q_1 = 76\ -\ 56\ =\ 20$

   Thus, the interquartile range of this data set is 20.

10. Find the interquartile range of this data set:

    43 54 66 84 64 88 56 58 68 78 45

    (understand, MA 3.1 G.9/1)

    A. 21

    B. 22

    C. 23

    D. 24

    Solution 24

    Sort from lowest to highest: 43 45 54 56 58 64 66 68 78 84 88

    $Q_1\ position\ = \frac{1}{4}(11\ +\ 1)\ =\ 3$, then $Q_1\ =\ 54$

    $Q_3\ position\ = \frac{3}{4}(11\ +\ 1)\ =\ 9$, then $Q_3\ =\ 78$

    $IQR\ =\ Q_3 - Q_1 = 78\ -\ 54\ =\ 34$

    Thus, the interquartile range of this data set is 24.