

Answer on Question #58062 – Math – Statistics and Probability

Question 1

The mean and range of the set of numbers 1.20, 1.00, 0.90, 1.40, 0.80, 0.80, 1.20 & 1.10 are m and r respectively.

Find $m+r$.

1.69

1.68

1.67

1.66

Solution

Let's put the numbers into a table calculate the sum of all numbers (S) and divide it by the quantity of numbers ($n=8$):

i	x_i
1	1.20
2	1.00
3	0.90
4	1.40
5	0.80
6	0.80
7	1.20
8	1.10
S	8.4
S/n	1.05

To find the mean and range of the set of our numbers we need to use formula:

$$m = \frac{\sum_{i=1}^n x_i}{n} = \frac{8.4}{8} = 1.05$$

To find the range of the set of numbers we have to use another equation:

$$r = \max x_i - \min x_i = 1.40 - 0.80 = 0.60.$$

So, $m + r = 1.05 + 0.60 = 1.65$.

Unfortunately, there is no such an answer in the list, but it should be there. Perhaps it is a technical mistake.

Answer: 1.65.

Question 2

The score of 5 students in an examination are 6, 5, 8, 7 & 4 find the variance

- 3
- 2
- 2.5
- 4.5

Solution

Let's put the numbers into a table:

i	x_i	$(x_i - \bar{x})$	$(x_i - \bar{x})^2$
1	6	0	0
2	5	-1	1
3	8	2	4
4	7	1	1
5	4	-2	4
S	30	0	10
S/n	6	0	2

S – is the sum of all numbers; n - is the number of results.

To find the variance of the set of numbers we should use equation:

$$\text{var} = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n}, \text{ where } \bar{x} = \frac{\sum_{i=1}^n x_i}{n} = \frac{30}{5} = 6.$$

So, we obtain the variance: $\text{var} = \frac{10}{5} = 2.$

Answer: 2.

Question 3

The mean of four numbers is 5 and the mean deviation is 3. Find the fourth number if the mean deviation of the first three number is 2

- 12
- 20
- 11
- 15

Solution

To find the mean deviation of the set of values we need to do three steps:

1. Find the mean of all values
2. Find the distance of each value from that mean (subtract the mean from each value, ignore minus signs)

3. Then find the mean of those distances

So, we have for four numbers: $\bar{x} = \frac{\sum_{i=1}^4 x_i}{4} = 5 \Rightarrow \sum_{i=1}^4 x_i = 20$.

$$MD = \frac{\sum_{i=1}^4 |x_i - 5|}{4} = 3 \Rightarrow \sum_{i=1}^4 |x_i - 5| = 12.$$

And we have equation for three numbers:

$$MD^* = \frac{\sum_{i=1}^3 |x_i - 5|}{3} = 2 \Rightarrow \sum_{i=1}^3 |x_i - 5| = 6.$$

$$MD = 6 + |x_4 - 5| = 12 \Rightarrow |x_4 - 5| = 6.$$

So, $x_4 = 11$ or $x_4 = -1$.

We select among possible answers: $x_4 = 11$.

Answer: 11.