新东方在线

GRE数学

5.1统计

M A K E I T E A S Y

5.1.1 数据分布

1. 平均数 （Mean）

$$\overline{x} = \frac{x_1 + x_2 + \cdots + x_n}{n}$$

5.1.1 数据分布

2. 中位数（Median）

In statistics, a *median* is the number separating the higher half of a data sample, a population, or a probability distribution, from the lower half. The *median* of a finite list of numbers can be found by arranging all the observations from lowest value to highest value and picking the middle one. For example, the median of {3, 3, 5, 9, 11} is 5; the median of {3, 5, 7, 9} is (5 + 7) / 2 = 6.

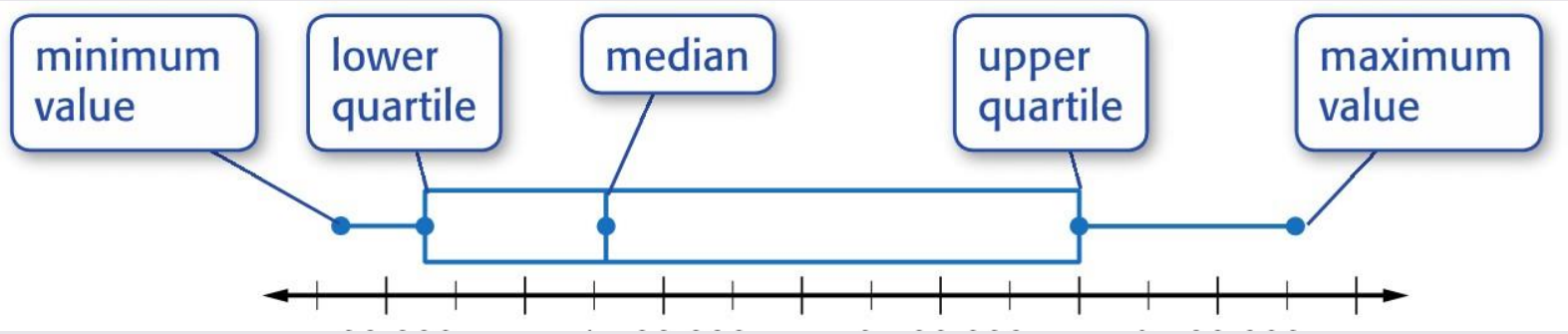
5.1.1 数据分布

3. 众数（Mode）

The mode of a sample is the element that occurs most often in the collection.

5.1.1 数据分布

4. 箱形图（Box Plot）



5.1.1 数据分布

5. 极差（Range）

The range of a sample is the difference between the biggest element and the smallest element.

5.1.1 数据分布

6. 方差&标准差（Variance & Standard Deviation）

$$s^2 = \frac{1}{n}[(x_1 - x)^2 + (x_2 - x)^2 + \cdots + (x_n - x)^2]$$

其中n为样本容量，x为样本平均值

*标准差 s是方差的算数平方根。同样用来衡量数据的离散程度;

数据越集中，标准差和方差越小；越离散，标准差和方差越大

5.1.1 数据分布

6. 方差&标准差（Variance & Standard Deviation）

例1:

The numbers in data set S have a standard deviation of 5. If a new data set is formed by adding 3 to each number in S, what is the standard deviation of the numbers in the new data set?

5.1.1 数据分布

6. 方差&标准差（Variance & Standard Deviation）

例2:

A list of numbers has a mean of 8 and a standard deviation of 2.5. If x is a number in the list that is 2 standard deviation above the mean, what is the value of x?

5.1.1 数据分布

7. 离群值（Outlier）

The outlier of a data set may have a few values that are much larger or smaller than the rest of the values in the set.

离群值是指在一组数据中有几个数值与其他数值相比相差更大或更小的数值在23, 15, 35, 66, 45, 29, 158数列当中，158是outlier

5.1.2 练习

1. The first term in a certain sequence is 1, the 2nd term in the sequence is 2, and, for all integers $n \geq 3$, the n the term in the sequence is the average (arithmetic mean) of the first n-1 terms in the sequence. What is the value of the 6th term in the sequence? Give your answer as a fraction.

2. X is an integer and 23<x<27.
Quantity A: The median of the five integers 23, 24, 26, 27, and x.
Quantity B: 25

3. The table above shows the frequency distribution of the heights of 80 students. What is the least possible range of the heights of the 80 students?

DISTRIBUTION OF THE HEIGHTS OF 80 STUDENTS

Height (centimeters)	Number of Students
140-144	6
145-149	26
150-154	32
155-159	12
160-164	4
Total	80

4.For a certain distribution, the measurement 12.1 is 1.5 standard deviations below the mean, and the measurement 17.5 is 3.0 standard deviations above the mean. What is the mean of the distribution?

5. Each of the following linear equations defines y as a function of x for all integers x from 1 to 100. For which of the following equations is the standard deviation of the y-values corresponding to all the x-values the greatest?

6. Quantity A: The sum of the first 7 positive integers
Quantity B: 7 times the median of the first 7 positive integers

7. Quantity A: The range of the ages of the 20 oldest employees of the business
Quantity B: 11 years

AGE DISTRIBUTION OF EMPLOYEES OF A BUSINESS

Age Interval	Number of Employees
15-24	17
25-34	25
35-44	26
45-54	21
55-64	18
Total	106

8. In a quality-control test, 50 boxes-each containing 30 machine parts-were examined for defective parts. The number of defective parts was recorded for each box, and the average (arithmetic mean) of the 50 recorded numbers of defective parts per box was 1.12. Only one error was made in recording the 50 numbers: “1” defective part in a certain box was incorrectly recorded as “10”.

Quantity A: The actual average number of defective parts per box
Quantity B: 0.94

9. List X and List Y each contain 60 numbers. Frequency distributions for each list are given above. The average (arithmetic mean) of the numbers in list X is 2.7, and the average of the numbers in list Y is 7.1. List Z contains 120 numbers: the 60 numbers in list X and the 60 numbers in list Y.
Quantity A: The average of the 120 numbers in list Z
Quantity B: The median of the 120 numbers in list Z

10. b-3, b-1, b+2, b+3, b+4
The median of the five terms listed above is 5, where b is a constant. What is the average (arithmetic mean) of the five terms?

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Thanks

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