

Please note the following:

- A. I was assured MANY TIMES, by various GMAT tutors, that GMAT won't ask you to actually calculate SD, but rather to understand the concept of it. Though KNOWING how it's calculated helps in understanding the concept.
- B. During the real GMAT it's highly unlikely to get more than one or two questions on SD (as on combinatorics), actually you may see none, so do not spend too much of your preparation time on it, it's better to concentrate on issues you'll definitely face on G-day.

Many questions below are easy, some are tough, but anyway they are good to master in solving SD problems. I'll post OA after some discussions. Please provide your way of thinking along with the answer. Thanks.

Here we go:

1. A set of data consists of the following 5 numbers: 0, 2, 4, 6, and 8. Which two numbers, if added to create a set of 7 numbers, will result in a new standard deviation that is close to the standard deviation for the original 5 numbers?
(A) -1 and 9
(B) 4 and 4
(C) 3 and 5
(D) 2 and 6
(E) 0 and 8
2. A certain list of 100 data has an average of 6 and standard deviation of d where d is positive. Which of the following pairs of data, when added to the list must result in a list of 102 data with the standard deviation less than d ?
(A) 0 and 6
(B) 0 and 12
(C) 0 and 0
(D) -6 and 0
(E) 6 and 6
3. For a certain examination, a score of 58 was 2 standard deviations below the mean, and a score of 98 was 3 standard deviations above the mean. What was the mean score for the examination?
(A) 74
(B) 76
(C) 78
(D) 80
(E) 82
4. Which of the following distribution of numbers has the greatest standard deviation?
(A) $\{-3, 1, 2\}$
(B) $\{-2, -1, 1, 2\}$
(C) $\{3, 5, 7\}$
(D) $\{-1, 2, 3, 4\}$
(E) $\{0, 2, 4\}$
5. Which of the following has the same standard deviation as $\{s, r, t\}$?
I. $\{r-2, s-2, t-2\}$
II. $\{0, s-t, s-r\}$
III. $\{|r|, |s|, |t|\}$
(A) I only
(B) II only
(C) III only
(D) I and II only
(E) I and III only
6. A certain characteristic in a large population has a distribution that is symmetric about the mean m . If 68% of the distribution lies one standard deviation d of the mean, what percent of the distribution is less than $m+d$?
(A) 16%
(B) 32%
(C) 48%
(D) 84%
(E) 92%
7. Which of the following data sets has the third largest standard deviation?
(A) $\{1, 2, 3, 4, 5\}$
(B) $\{2, 3, 3, 3, 4\}$
(C) $\{2, 2, 2, 4, 5\}$
(D) $\{0, 2, 3, 4, 6\}$
(E) $\{-1, 1, 3, 5, 7\}$

8. The table below represents three sets of numbers with their respective medians, means and standard deviations. The third set, Set [A+B], denotes the set that is formed by combining Set A and Set B.

Median Mean StandardDeviation

Set A: X, Y, Z.

Set B: L, M, N.

Set [A + B]: Q, R, S.

If $X - Y > 0$ and $L - M = 0$, then which of the following must be true?

I. $Z > N$

II. $R > M$

III. $Q > R$

(A) I only

(B) II only

(C) III only

(D) I and II only

(E) None

9. E is a collection of four odd integers and the greatest difference between any two integers in E is 4. The standard deviation of E must be one of how many numbers?

(A) 3

(B) 4

(C) 5

(D) 6

(E) 7

10. If a certain sample of data has a mean of 20.0 and a standard deviation of 3.0, which of the following values is more than 2.5 standard deviations from the mean?

(A) 12.0

(B) 13.5

(C) 17.0

(D) 23.5

(E) 26.5

11. Arithmetic mean and standard deviation of a certain normal distribution are 13.5 and 1.5. What value is exactly 2 standard deviations less than the mean?

(A) 10.5

(B) 11

(C) 11.5

(D) 12

(E) 12.5

CALCULATING STANDARD DEVIATION OF A SET $\{x_1, x_2, \dots, x_n\}$:

1. Find the mean, m , of the values.

2. For each value x_i calculate its deviation ($x_i - m$) from the mean.

3. Calculate the squares of these deviations.

4. Find the mean of the squared deviations. This quantity is the variance.

5. Take the square root of the variance. The quantity is the SD.

TIPS:

1. $|\text{Median-Mean}| \leq \text{SD}$.

2. Variance is the square of the standard deviation.

3. If Range or SD of a list is 0, then the list will contain all identical elements. And vice versa: if a list contains all identical elements then the range and SD of a list is 0. If the list contains 1 element: Range is zero and SD is zero.

4. SD is always ≥ 0 . SD is 0 only when the list contains all identical elements (or which is same only 1 element).

5. Symmetric about the mean means that the shape of the distribution on the right and left side of the curve are mirror-images of each other.

6. If we add or subtract a constant to each term in a set:

Mean will increase or decrease by the same constant.

SD will not change.

7. If we increase or decrease each term in a set by the same percent:

Mean will increase or decrease by the same percent.

SD will increase or decrease by the same percent.

8. Changing the signs of the element of a set (multiplying by -1) has no effect on SD.

9. The SD of any list is not dependent on the average, but on the deviation of the numbers from the average. So just by knowing that two lists having different averages doesn't say anything about their standard deviation - different averages can have the same SD.