

S.ID.A.4: Normal Distributions 1b

- 1 Suppose two sets of test scores have the same mean, but different standard deviations, σ_1 and σ_2 , with $\sigma_2 > \sigma_1$. Which statement best describes the variability of these data sets?
 - 1) Data set one has the greater variability.
 - 2) Data set two has the greater variability.
 - 3) The variability will be the same for each data set.
 - 4) No conclusion can be made regarding the variability of either set.

- 2 On a standardized test, Cathy had a score of 74, which was exactly 1 standard deviation below the mean. If the standard deviation for the test is 6, what is the mean score for the test?

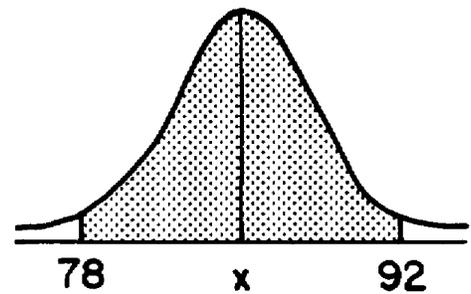
- 3 On a standardized test, a score of 82 falls exactly 1 standard deviation below the mean. If the standard deviation for the test is 4, what is the mean score for the test?

- 4 On a standardized test, Phyllis scored 84, exactly one standard deviation above the mean. If the standard deviation for the test is 6, what is the mean score for the test?

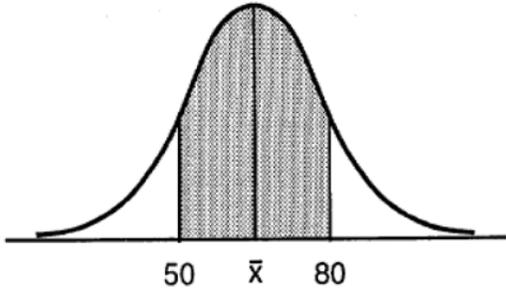
- 5 On a standardized test, a score of 86 falls exactly 1.5 standard deviations below the mean. If the standard deviation for the test is 2, what is the mean score for this test?

- 6 On a standardized examination, Laura received a score of 85, which was exactly 2 standard deviations above the mean. If the standard deviation for the examination is 4, what is the mean for this examination?

- 7 In the accompanying diagram, the shaded area represents approximately 95% of the scores on a standardized test. If these scores ranged from 78 to 92, which could be the standard deviation?



- 8 In the accompanying diagram, about 68% of the scores fall within the shaded area, which is symmetric about the mean, \bar{x} . The distribution is normal and the scores in the shaded area range from 50 to 80.



What is the standard deviation of the scores in this distribution?

- 9 The heights of the members of a high school class are normally distributed. If the mean height is 65 inches and a height of 72 inches represents the 84th percentile, what is the standard deviation for this distribution?
- 10 The heights of a group of girls are normally distributed with a mean of 66 inches. If 95% of the heights of these girls are between 63 and 69 inches, what is the standard deviation for this group?
- 11 In a normal distribution, $\bar{x} + 2\sigma = 80$ and $\bar{x} - 2\sigma = 40$ when \bar{x} represents the mean and σ represents the standard deviation. The standard deviation is
- 12 In a normal distribution, 68% of the scores fall between 72 and 86 and the mean is 79. What is the standard deviation?
- 13 In a certain school district, the ages of all new teachers hired during the last 5 years are normally distributed. Within this curve, 95.4% of the ages, centered about the mean, are between 24.6 and 37.4 years. Find the mean age and the standard deviation of the data.
- 14 On a test that has a normal distribution of scores, a score of 57 falls one standard deviation below the mean, and a score of 81 is two standard deviations above the mean. Determine the mean score of this test.

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Answer Section

1 ANS: 2 REF: 011901aii

2 ANS:
80

REF: 068624siii

3 ANS:
86

REF: 089317siii

4 ANS:
78

REF: 069517siii

5 ANS:
89

If the standard deviation is 2, then 1.5 deviations equals 3 points. Since 86 is below the mean, add 3 to 86 to equal 89.

REF: 010604b

6 ANS:
77

REF: 089925siii

7 ANS:
3.5

REF: 069030siii

8 ANS:
15

REF: 069726siii

9 ANS:
7

REF: 080020siii

10 ANS:
1.5

REF: 010331siii

11 ANS:
10

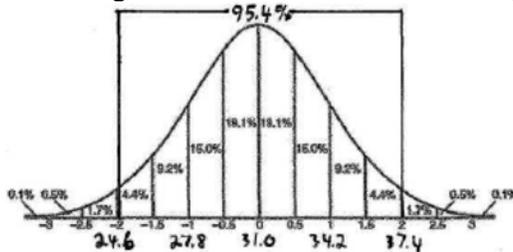
REF: 018930siii

12 ANS:
7

REF: 019712siii

13 ANS:

31, 3.2. Since the group of teachers between 24.6 and 37.4 years old represents 95.4% of the population, this group is within 2 standard deviations of the mean. To find the mean, average 24.6 and 37.4, which equals 31. To find the standard deviation, find the range of the scores $37.4 - 24.6 = 12.8$, and divide 12.8 by 4 (the # of standard



deviations) which equals 3.2.

REF: 060324b

14 ANS:

$$sd = \frac{81 - 57}{3} = 8$$

$$57 + 8 = 65$$

$$81 - 2(8) = 65$$

REF: 011534a2