

### S.ID.A.4: Normal Distributions 5

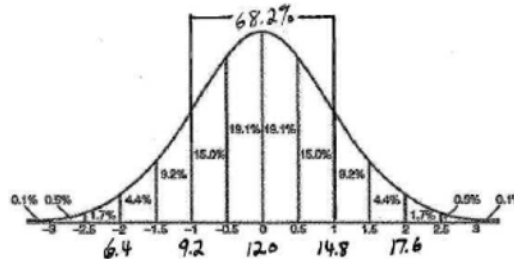
- 1 In a New York City high school, a survey revealed the mean amount of cola consumed each week was 12 bottles and the standard deviation was 2.8 bottles. Assuming the survey represents a normal distribution, how many bottles of cola per week will approximately 68.2% of the students drink?
  - 1) 6.4 to 12
  - 2) 6.4 to 17.6
  - 3) 9.2 to 14.8
  - 4) 12 to 20.4
  
- 2 The amount of juice dispensed from a machine is normally distributed with a mean of 10.50 ounces and a standard deviation of 0.75 ounce. Which interval represents the amount of juice dispensed about 68.2% of the time?
  - 1) 9.00–12.00
  - 2) 9.75–10.50
  - 3) 9.75–11.25
  - 4) 10.50–11.25
  
- 3 On a standardized test, the mean is 76 and the standard deviation is 4. Between which two scores will approximately 68% of the scores fall?
  - 1) 68 and 84
  - 2) 72 and 80
  - 3) 74 and 78
  - 4) 76 and 80
  
- 4 In a certain high school, a survey revealed the mean amount of bottled water consumed by students each day was 153 bottles with a standard deviation of 22 bottles. Assuming the survey represented a normal distribution, what is the range of the number of bottled waters that approximately 68.2% of the students drink?
  - 1) 131 – 164
  - 2) 131 – 175
  - 3) 142 – 164
  - 4) 142 – 175
  
- 5 A survey of high school girls found that the mean number of text messages sent per day by the girls was 62, with a standard deviation of 12. If a normal distribution is assumed, which interval represents the number of texts sent by 68.2% of the girls?
  - 1) 38–86
  - 2) 44–80
  - 3) 50–74
  - 4) 56–68
  
- 6 The mean of a normally distributed set of data is 56, and the standard deviation is 5. In which interval do approximately 95.4% of all cases lie?
  - 1) 46–56
  - 2) 46–66
  - 3) 51–61
  - 4) 56–71
  
- 7 The heights of the girls in the eleventh grade are normally distributed with a mean of 66 inches and a standard deviation of 2.5 inches. In which interval do approximately 95% of the heights fall?
  - 1) 61 – 66 inches
  - 2) 61 – 71 inches
  - 3) 63.5 – 68.5 inches
  - 4) 66 – 71 inches

- 8 The mean of a normally distributed set of data is 52 and the standard deviation is 4. Approximately 95% of all the cases will lie between which measures?
- |              |              |
|--------------|--------------|
| 1) 44 and 52 | 3) 48 and 56 |
| 2) 44 and 60 | 4) 52 and 64 |
- 9 On a standardized test with a normal distribution of scores, the mean score is 82 and the standard deviation is 6. Which interval contains 95% of the scores?
- |            |            |
|------------|------------|
| 1) 70 – 82 | 3) 76 – 88 |
| 2) 70 – 94 | 4) 76 – 94 |
- 10 A standardized test with a normal distribution of scores has a mean score of 43 and a standard deviation of 6.3. Which range would contain the score of a student in the 90th percentile?
- |                |                |
|----------------|----------------|
| 1) 30.4 – 36.7 | 3) 43.0 – 49.3 |
| 2) 36.7 – 43.0 | 4) 49.3 – 55.6 |
- 11 On a standardized test with a normal distribution, the mean is 20 and the standard deviation is 2.6. In which interval would the greatest number of scores occur?
- |                |                |
|----------------|----------------|
| 1) 12.2 – 14.8 | 3) 22.6 – 25.2 |
| 2) 17.4 – 20.0 | 4) 27.8 – 30.4 |
- 12 A set of test scores is normally distributed with a mean of 80 and a standard deviation of 8. Between what two scores should 68 percent of the scores fall?
- 13 A set of test scores is distributed normally with a mean of 70 and a standard deviation of 6. Between which two scores could 68% of the scores lie?
- 14 A set of boys' heights is distributed normally with a mean of 58 inches and a standard deviation of 2 inches. Express, in inches, between which two heights should 95% of the heights fall.
- 15 A survey of the soda drinking habits of the population in a high school revealed the mean number of cans of soda consumed per person per week to be 20 with a standard deviation of 3.5. If a normal distribution is assumed, find an interval that the total number of cans per week approximately 95% of the population of this school will drink. Explain why you selected that interval.
- 16 Mrs. Ramírez is a real estate broker. Last month, the sale prices of homes in her area approximated a normal distribution with a mean of \$150,000 and a standard deviation of \$25,000. A house had a sale price of \$175,000. What is the percentile rank of its sale price, to the *nearest whole number*? Explain what that percentile means. Mrs. Ramírez told a customer that most of the houses sold last month had selling prices between \$125,000 and \$175,000. Explain why she is correct.

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**Answer Section**

1 ANS: 3

68.2% of the population of a normal distribution will be within 1 standard deviation of the mean, and will drink

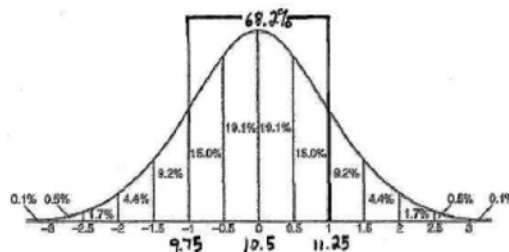


9.2-14.8 bottles of cola per week.

REF: 080202b

2 ANS: 3

68.2% of the population of a normal distribution will be within 1 standard deviation of the mean. Therefore the



relevant range is 9.75-11.25.

REF: 060412b

3 ANS: 2

REF: 068426siii

4 ANS: 2

$$\bar{x} \pm \sigma$$

$$153 \pm 22$$

$$131 - 175$$

REF: 011307a2

5 ANS: 3

$$\bar{x} \pm \sigma$$

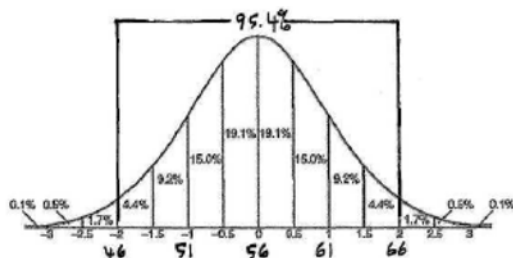
$$62 \pm 12$$

$$50 - 74$$

REF: 011706a2

6 ANS: 2

95.4% of the population of a normal distribution will be within 2 standard deviations of the mean. Therefore the



relevant range is 46-66.

REF: 080405b

7 ANS: 2

REF: 010426siii

8 ANS: 2

REF: 089035siii

9 ANS: 2

REF: 089831siii

10 ANS: 4

REF: 019930siii

11 ANS: 2

REF: 088721siii

12 ANS:

72-88

REF: 088610siii

13 ANS:

64-76

REF: 089402siii

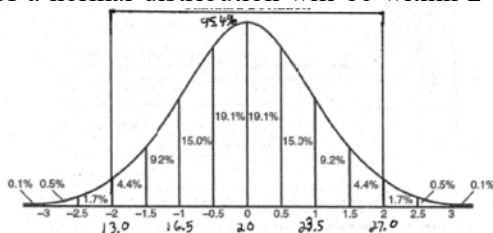
14 ANS:

54-62

REF: 089606siii

15 ANS:

95% of the population of a normal distribution will be within 2 standard deviations of the mean. Therefore the

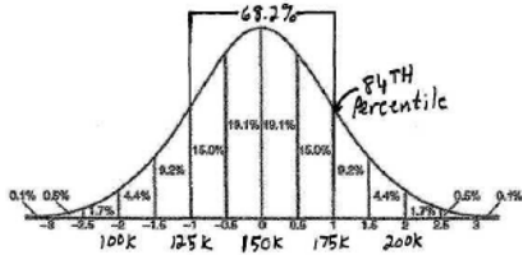


relevant range is 13-27.

REF: fall9924b

16 ANS:

84. A sales price of \$175,000 is 1 standard deviation greater than the mean, and has a 84<sup>th</sup> percentile rank. This means that 84% of the homes in Ms. Ramírez' area sold for \$175,000 or less and that 16% sold for more than \$175,000. Selling prices between \$125,000 and \$175,000 represent a range within 1 standard of the mean of \$150,000, or 68.2% of the selling prices. Since 68.2% > 50%, Ms. Ramírez is correct.



REF: 060432b