

A2.S.5: Normal Distributions 3: Know and apply the characteristics of the normal distribution

- 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 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
- 6 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
- 7 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
 - 2) 44 and 60
 - 3) 48 and 56
 - 4) 52 and 64
- 8 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
 - 2) 70 – 94
 - 3) 76 – 88
 - 4) 76 – 94
- 9 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?

- 10 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?
- 11 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.
- 12 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.
- 13 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?
- 12.2 – 14.8
 - 17.4 – 20.0
 - 22.6 – 25.2
 - 27.8 – 30.4
- 14 On a standardized test, the distribution of scores is normal, the mean of the scores is 75, and the standard deviation is 5.8. If a student scored 83, the student's score ranks
- below the 75th percentile
 - between the 75th percentile and the 84th percentile
 - between the 84th percentile and the 97th percentile
 - above the 97th percentile
- 15 The lengths of 100 pipes have a normal distribution with a mean of 102.4 inches and a standard deviation of 0.2 inch. If one of the pipes measures exactly 102.1 inches, its length lies
- below the 16th percentile
 - between the 50th and 84th percentiles
 - between the 16th and 50th percentiles
 - above the 84th percentile
- 16 The scores on a standardized exam have a mean of 82 and a standard deviation of 3.6. Assuming a normal distribution, a student's score of 91 would rank
- below the 75th percentile
 - between the 75th and 85th percentiles
 - between the 85th and 95th percentiles
 - above the 95th percentile
- 17 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?
- 30.4 – 36.7
 - 36.7 – 43.0
 - 43.0 – 49.3
 - 49.3 – 55.6
- 18 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 REF: 080202b
- 2 ANS: 3 REF: 060412b
- 3 ANS: 2 REF: 068426siii
- 4 ANS: 2
 $\bar{x} \pm \sigma$
 153 ± 22
 $131 - 175$
 REF: 011307a2
- 5 ANS: 2 REF: 080405b
- 6 ANS: 2 REF: 010426siii
- 7 ANS: 2 REF: 089035siii
- 8 ANS: 2 REF: 089831siii
- 9 ANS:
 $72-88$
 REF: 088610siii
- 10 ANS:
 $64-76$
 REF: 089402siii
- 11 ANS:
 $54 - 62$
 REF: 089606siii
- 12 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
- 13 ANS: 2 REF: 088721siii
- 14 ANS: 3 REF: 060206b
- 15 ANS: 1 REF: fall0915a2
- 16 ANS: 4
 $\frac{91 - 82}{3.6} = 2.5 \text{ sd}$
 REF: 081521a2
- 17 ANS: 4 REF: 019930siii

18 ANS:

84. A sales price of \$175,000 is 1 standard deviation greater than the mean, and has a 84th 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