Summary Statistics for a Quantitative Variable Quiz

CollegeBoard

- 1. Roger claims that the two statistics most likely to change greatly when an outlier is added to a small data set are the mean and the median. Is Roger's claim correct?
 - (A) Yes, both the mean and median are likely to change greatly.
 - (B) No, only the mean is likely to change greatly.
 - (C) No, only the median is likely to change greatly.
 - (D) No, neither the mean nor the median are likely to change greatly.
 - (E) There is not enough information to determine if the mean or the median is likely to change greatly.
- 2. A golfer recorded the following scores for each of four rounds of golf: 86, 81, 87, 82. The mean of the scores is 84. What is the sum of the squared deviations of the scores from the mean?

(A)
$$\sum (x - \bar{x}) = (86 - 84) + (81 - 84) + (87 - 84) + (82 - 84)$$

(B)
$$\sum |x - \bar{x}| = |86 - 84| + |81 - 84| + |87 - 84| + |82 - 84|$$

(C)
$$2\sum |x-\bar{x}| = 2[|86-84|+|81-84|+|87-84|+|82-84|]$$

(D)
$$\sum (x - \bar{x})^2 = (86 - 84)^2 + (81 - 84)^2 + (87 - 84)^2 + (82 - 84)^2$$

(E)
$$\left[\sum |x - \bar{x}|\right]^2 = \left[|86 - 84| + |81 - 84| + |87 - 84| + |82 - 84|\right]^2$$

3. The following list shows the selling prices of 8 houses in a certain town.

House	Price	House	Price
A	\$302,100	Е	\$275,800
В	\$275,800	F	\$295,000
С	\$305,400	G	\$281,900
D	\$250,600	Н	\$284,700

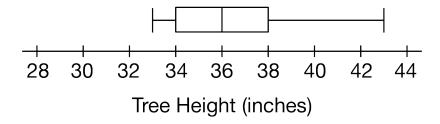
What is the median selling price of the houses in the list?

- (A) \$263,200
- (B) \$283,300
- (C) \$288,450
- (D) \$290,600
- (E) \$293,400
- 4. A statistician at a metal manufacturing plant is sampling the thickness of metal plates. If an outlier occurs within a particular sample, the statistician must check the configuration of the machine. The distribution of metal thickness has mean 23.5 millimeters (mm) and standard deviation 1.4 mm. Based on the two-standard deviations rule for outliers, of the following, which is the greatest thickness that would require the statistician to check the configuration of the machine?

AP Statistics

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- (A) 19.3 mm
- (B) 20.6 mm
- (C) 22.1 mm
- (D) 23.5 mm
- (E) 24.9 mm
- 5. At a photography contest, entries are scored on a scale from 1 to 100. At a recent contest with 1,000 entries, a score of 68 was at the 77th percentile of the distribution of all the scores. Which of the following is the best description of the 77th percentile of the distribution?
 - (A) There were 770 entries with a score less than or equal to 68.
 - (B) There were at least 230 entries with a score of 77.
 - (C) There were 23% of the entries with a score less than or equal to 68.
 - (D) There were 77% of the entries with a score equal to 68.
 - (E) There were at least 77% of the entries with a score greater than 68.
- 6. The following boxplot summarizes the heights of a sample of 100 trees growing on a tree farm.



Emily claims that a tree height of 43 inches is an outlier for the distribution. Based on the $1.5 \times IQR$ rule for outliers, is there evidence to support the claim?

- (A) Yes, because (max Q3) is greater than (Q1 min).
- (B) Yes, because 43 is greater than (Q3 + IQR).
- (C) Yes, because 43 is greater than $(Q1 1.5 \times IQR)$.
- (D) No, because 43 is not greater than $(Q3 + 1.5 \times IQR)$.
- (E) No, because 43 is greater than $(Q1 1.5 \times IQR)$.