Summary Statistics for a Quantitative Variable Quiz

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

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

House	Price	House	Price
A	$302,100	E	$275,800
B	$275,800	F	$295,000
C	$305,400	G	$281,900
D	$250,600	H	$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?

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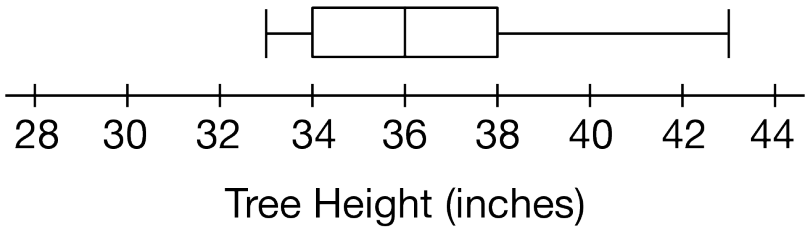
(A) 19.3 mm
(B) 20.6 mm
(C) 22.1 mm
(D) 23.5 mm
(E) 24.9 mm

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 $1.5 \times \text{IQR}$ rule for outliers, is there evidence to support the claim?

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