

SAT Prep

Problem Solving -2



CONCEPTS

QUESTIONS

1. Mr. Smith left his house at 7:30 a.m. and drove at a rate of 50 mph until 10:00 a.m. He then stopped for half an hour. At what rate (in mph) must he now travel in order to get to work by noon if he still has 105 miles to go?



QUESTIONS

2. A boy walks at a rate of 5 mph for 2 hours and then rides his bike at a rate of 12 mph for 3 hours. What is his average rate for the entire trip, in mph?



QUESTIONS

3. A contractor estimates that he can paint a house in 5 days by using 6 men. If he actually uses only 5 men for the job, how many days will they take to paint the house?
- A. 5
 - B. $5\frac{1}{4}$
 - C. $5\frac{1}{2}$
 - D. 6



QUESTIONS

4. One cookbook recommends that a person can substitute 1 tablespoon (Tbsp) of dried mint leaves for $\frac{1}{4}$ cup (c) of fresh mint leaves. The salad recipe calls 2 Tbsp of fresh mint leaves. How many Tbsp of dried mint leaves could a person substitute into the recipe? (There are 16Tbsp in 1c)



QUESTIONS

5. Linda has m minutes of homework in each of her s subjects. What part of her homework does she complete in an hour?

A. $\frac{1}{ms}$

B. $\frac{ms}{60}$

C. $\frac{60}{ms}$

D. $\frac{s}{60m}$



QUESTIONS

6. The Kentucky Derby is a horse race run over a distance of 10 furlongs. The fastest Derby winners complete the race in about 2 minutes. To the nearest tenth of a mile per hour, how fast must a horse run to complete the Derby in 2 minutes? (*1 mile = 8 furlongs*)



QUESTIONS

7. Zhang Lei spent \$20.00 during his last outing at the bowling alley. This included a one time shoe rental fee of \$3.50. He spent the rest of the money on bowling a number of games. If it took Zhang Lei 45 minutes to bowl each game and he spent 2 hours and 15 minutes bowling, how much did it cost per game?
- A. \$3.00
 - B. \$5.50
 - C. \$6.67
 - D. \$7.34



QUESTIONS

8.

3, k , 2, m , 3, 8

The arithmetic mean of the list of numbers above is 4. If k and m are integers and $k \neq m$, what is the median of the list?

A. 2

B. 2.5

C. 3

D. 3.5



QUESTIONS

9. If m is the average (arithmetic mean) of the first 10 positive multiples of 5 and if M is the median of the first 10 positive multiples of 5, what is the value of $M - m$?
- A. -5
 - B. 0
 - C. 5
 - D. 25



QUESTIONS

10.

I. 72, 73, 74, 75, 76

II. 74, 74, 74, 74, 74

III. 62, 74, 74, 74, 89

The data sets, I, II, and III above are ordered from greatest standard deviation to least standard deviation in which of the following?

A. I, II, III

B. I, III, II

C. II, III, I

D. III, I, II



QUESTIONS

11.

2, 4, 8, n , 3, 5, 7, 9, 6

In this list above, if n is an integer between 1 and 10, inclusive, then the median must be

A. Either 4 or 5

B. Either 5 or 6

C. Either 6 or 7

D. n



QUESTIONS

12.

List I: 3, 6, 8, 19

List II: x , 3, 6, 8, 19

If the median of the numbers in list I above is equal to the median of the numbers in list II above, what is the value of x ?

A. 6

B. 7

C. 8

D. 9



QUESTIONS

13. S is a set containing 9 different numbers. T is a set containing 8 different numbers, all of which are members of S . Which of the following statements CANNOT be true?
- A. The mean of S is equal to the mean of T .
 - B. The median of S is equal to the median of T .
 - C. The range of S is equal to the range of T .
 - D. The range of S is less than the range of T .



QUESTIONS

14. If the average (arithmetic mean) of x and y is 60 and the average (arithmetic mean) of y and z is 80, what is the value of $z - x$?
- A. 70
 - B. 40
 - C. 20
 - D. 10



QUESTIONS

15. If a basketball team scores an average (arithmetic mean) of x points per game for n games and then scores y points in its next game, what is the team's average score for all the $n + 1$ games?

A. $\frac{nx + y}{n + 1}$

B. $x + \frac{y}{n} + 1$

C. $x + \frac{y}{n}$

D. $\frac{n(x + y)}{n + 1}$



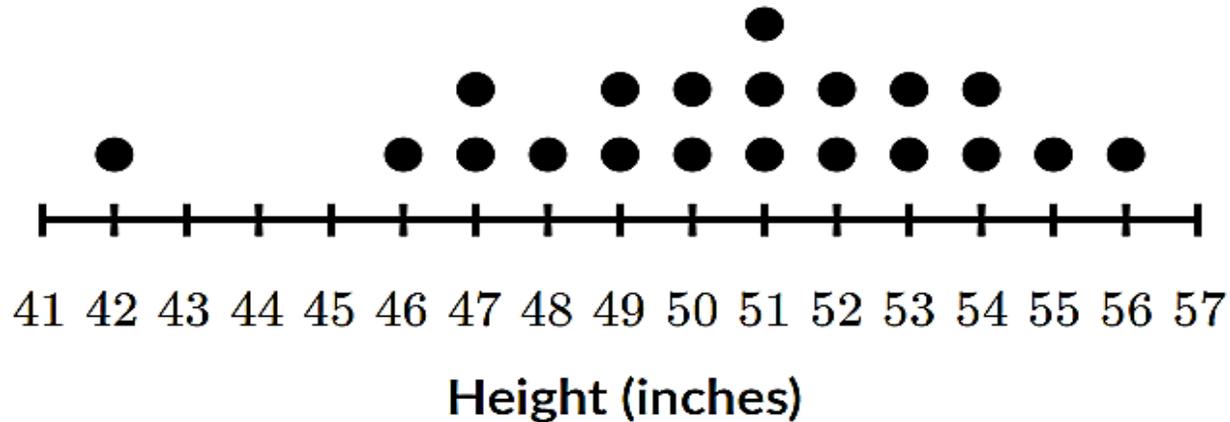
QUESTIONS

16. Phase I clinical trials are run to determine the safety of all new drugs, especially with respect to the severity and duration of side effects. A physician is overseeing a Phase I trial based on 800 healthy participants. Half of the are given the drug, and half are given an inert pill. The mean duration of side effects for those participants who were given the drug was 72 hours with a margin of error of 6 hours. The physician is planning to replicate trial in an attempt to decrease this margin of error. Which of the following most likely lead to a decrease in the margin of error for the mean duration of side effects?
- A. Decrease the trial size to 400 healthy participants.
 - B. Decrease the trial size to 400 participants, and replace half the healthy participants with sick patients.
 - C. Increase the trial size to 1,600 healthy participants.
 - D. Increase the trial size to 1,600 participants, and replace half the healthy participants with sick patients.



QUESTIONS

17.



The dot plot above shows the height in inches of 20 elementary school students. If the shortest student is removed from the data set and the summary statistics are re-calculated, then the median height of the 19 remaining students would be

- A. Less than that of all 20 students.
- B. Same as that of all 20 students.
- C. Greater than that of all 20 students.
- D. Cannot be determined.

QUESTIONS

18. The minimum value of a data set consisting of 15 positive integers is 29. A new data set consisting of 16 positive integers is created by including 22 in the original data set. Which of the following measures must be 7 greater for the new data set than for the original data set?

Decrease the trial size to 400 healthy participants.

- A. The mean
- B. The median
- C. The range
- D. The standard deviation



QUESTIONS

19. Last week, George drove an average of 52 miles per day. If the day he drove the longest distance is removed, the average distance he drove in the remaining 6 days becomes 40 miles per day. What was the longest distance, in miles, George drove in a single day last week?



QUESTIONS

20. A youth activist group surveyed a random sample of 500 teenagers between the ages of 16 and 17 in the U.S. to assess their opinions about lowering the voting age to 16. The survey showed that the majority of those sampled were in favor of lowering the voting age to 16. Based on the results, the majority of which of the following populations in the U.S. are most likely in favor of lowering the voting age to 16?

- A. All adults
- B. All registered voters
- C. All 16- and 17- years old
- D. All students at a particular high school.



QUESTIONS

21. A study was done on the lengths of frogs in a pond. A random sample of frogs was caught and tagged in order to ensure that none were measured more than once. The sample contained 50 American bullfrogs, of which 40% were shorter than 7 inches. Which of the following conclusions is best supported by the sample data?
- A. Approximately 40% of all American bullfrogs in the pond are shorter than 7 inches.
 - B. Approximately 40% of all frogs in the pond are shorter than 7 inches.
 - C. The average length of all frogs in the pond is approximately 7 inches.
 - D. The majority of all frogs in the pond are longer than 7 inches.



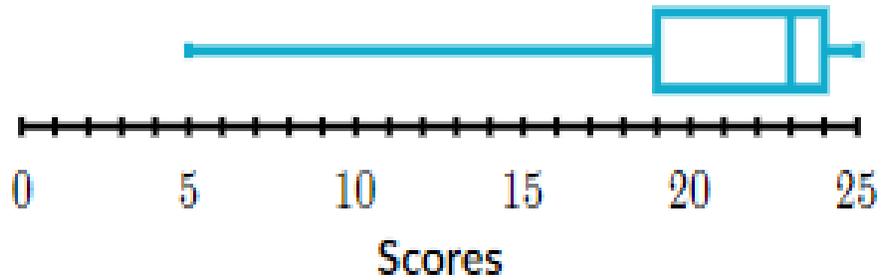
QUESTIONS

22. A study was conducted to determine if a new treatment is successful in treating insomnia. 500 participants were selected at random from a large population of people with insomnia. Half of the participants were randomly assigned to receive the treatment, and the other half did not receive the treatment. The resulting data showed that participants who received the treatment slept significantly better than those who did not. Based on the design and results of the study, which of the following is an appropriate conclusion?
- A. The new treatment is likely to improve the sleep of anyone who undergoes it.
 - B. The new treatment is better than all other available treatments in improving the sleep of people with insomnia.
 - C. The treatment is likely to improve the sleep of people with insomnia.
 - D. None of the conclusions are appropriate.



QUESTIONS

23.



The scores of 250 students are plotted in the box plot as shown above. Approximately how many students have scored between 19 and 24?

- A. 100
- B. 125
- C. 150
- D. 175



Thank you