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**Online Homework**

**Focused Exercises for Math SAT**

**Skill Set 9: Mean, Median, Mode**

Many of the problems in this exercise set came from The College Board, writers of the SAT exam.

1. The average (arithmetic mean) of  $x$  and  $y$  is 5 and the average of  $x$ ,  $y$ , and  $z$  is 8. What is the value of  $z$ ?
  - (A) 19
  - (B) 14
  - (C) 13
  - (D) 11
  - (E) 3
  
2. If  $2x - 5$ ,  $x + 1$ , and  $3x - 8$  are all integers and  $x + 1$  is the median of these integers, which of the following could be a value for  $x$ ?
  - (A) 5
  - (B) 7
  - (C) 9
  - (D) 10
  - (E) 11
  
3. Carlos delivered  $n$  packages on Monday, 4 times as many packages on Tuesday as on Monday, and 3 more packages on Wednesday than on Monday. What is the average (arithmetic mean) number of packages he delivered per day over the three days?
  - (A)  $2n - 3$
  - (B)  $2n - 1$
  - (C)  $2n + 1$
  - (D)  $2n + 3$
  - (E)  $6n + 1$

4.

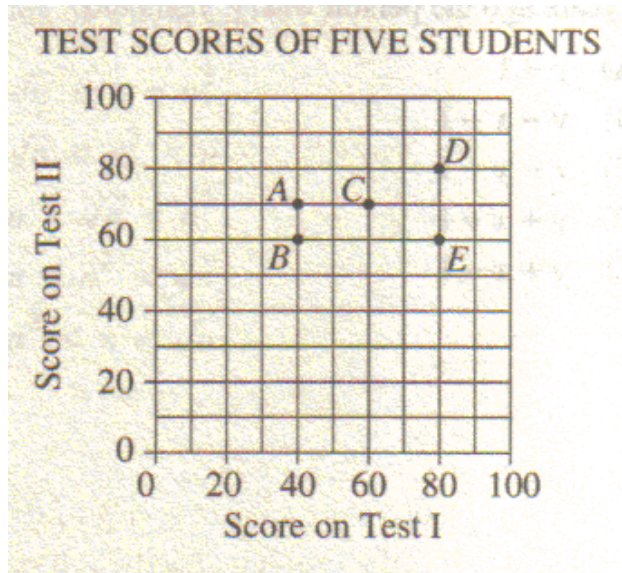
City	Noon Temperature (degrees Fahrenheit)
<i>A</i>	50°
<i>B</i>	33°
<i>C</i>	27°
<i>D</i>	$t^\circ$
<i>E</i>	68°
<i>F</i>	44°
<i>G</i>	40°

The table above shows the noon temperatures for seven cities designated *A* through *G*. If the median noon temperature of these cities is 40° F, then the noon temperature for City *D* could be any of the following EXCEPT

- (A) 29° F
  - (B) 35° F
  - (C) 39° F
  - (D) 40° F
  - (E) 42° F
5. If the average (arithmetic mean) of  $x$  and  $y$  is  $k$ , which of the following is the average of  $x$ ,  $y$ , and  $z$ ?

- (A)  $\frac{2k + z}{3}$
- (B)  $\frac{2k + z}{2}$
- (C)  $\frac{k + z}{3}$
- (D)  $\frac{k + z}{2}$
- (E)  $\frac{2(k + z)}{3}$

6., 7.



For which student was the change in scores from test I to test II the greatest?

- (A) A
- (B) B
- (C) C
- (D) D
- (E) E

What was the average (arithmetic mean) of the scores of the 5 students on test II ?

- (A) 60
- (B) 65
- (C) 68
- (D) 70
- (E) 72

8. If the areas of two regions are equal and the sum of the areas of the regions is 5, what is the average (arithmetic mean) of the areas of the two regions?
- (A) 0
- (B)  $\frac{5}{2}$
- (C)  $\frac{5}{4}$
- (D) 5
- (E) 10
9. When the sum of a list of prices is divided by the average (arithmetic mean) of the prices, the result is  $k$ . What does  $k$  represent ?
- (A) The sum of the prices.
- (B) Half of the sum of the prices.
- (C) The average of the prices.
- (D) The number of prices.
- (E) Half of the number of prices.
10. If the average (arithmetic mean) of 6, 6, 12, 16, and  $x$  is equal to  $x$ , what is the value of  $x$  ?
- (A) 6
- (B) 8
- (C) 9
- (D) 10
- (E) 11
11. The average (arithmetic mean) of the test scores of a class of  $p$  students is 70, and the average of the test scores of a class of  $n$  students is 92. When the scores of both classes are combined, the average score is 86. What is the value of  $\frac{p}{n}$  ?

12. If Peg traveled 10 miles in 2 hours and Linda traveled twice as far in half the time, what was Linda's average speed, in miles per hour?
- (A) 5
  - (B) 10
  - (C) 20
  - (D) 30
  - (E) 40

13.

#### HISTORY TEST RESULTS

Score	Number of Students
100	1
95	2
90	4
85	1
80	3
75	2
70	2
65	0
60	1

The scores on Tuesday's history test for 16 students are shown in the table above. Sam, who was the only student absent on Tuesday, will take the test next week. If Sam receives a score of 95 on the test, what will be the median score for the test?

- (A) 90
  - (B) 87.5
  - (C) 85
  - (D) 82.5
  - (E) 80
14. Each of 5 people had a blank card on which they wrote a positive integer. If the average (arithmetic mean) of these integers is 15, what is the greatest possible integer that could be on one of the cards?

15. The average (arithmetic mean) of the weights of 14 books is  $p$  pounds. In terms of  $p$ , what is the total weight of the books, in pounds?

(A)  $14 + p$

(B)  $p - 14$

(C)  $\frac{p}{14}$

(D)  $\frac{14}{p}$

(E)  $14p$

16.

WESTON HIGH SCHOOL ENROLLMENT

Year	Number of Students Enrolled
1992	$x$
1993	1552
1994	1238
1995	1459
1996	1351

The table above shows student enrollment at Weston High School from 1992 through 1996. If the median enrollment for the five years was 1351, and no two years had the same enrollment, what is the greatest possible value for  $x$ ?

17. If the average (arithmetic mean) of  $x$  and  $3x$  is 12, what is the value of  $x$ ?

(A) 2

(B) 4

(C) 6

(D) 12

(E) 24

18. In a certain club, the median age of the members is 11. Which of the following must be true?
- I. The oldest member in the club is at least 1 year older than the youngest.
  - II. If there is a 10 year old in the club, there is also a 12 year old.
  - III. The mode of the members' ages is 11.
- (A) None  
(B) I only  
(C) II only  
(D) III only  
(E) II and III
19. The average (arithmetic mean) of 5 positive integers is 350. Two of the integers are 99 and 102 and the other integers are greater than 102. If all 5 integers are different, what is the greatest possible value for any of the 5 integers?
20. If the average (arithmetic mean) of 5 consecutive even integers is  $n$ , what is the median of these 5 integers?
- (A) 0  
(B) 2  
(C)  $n$   
(D)  $n - 2$   
(E)  $n - 4$

21.

GAMES PLAYED IN SEPTEMBER

	Goals		Goals	Margin of Victory
Central	7	Northern	0	
Central	3	Westfield	1	
Central	3	Easton	2	
Central	5	Southern	1	
Central	2	Bayville	1	

Central High's field hockey team was undefeated in September, as shown in the table above. A team's margin of victory for a single game is defined as the number of goals it made minus the number of goals made by the losing team. What is the median of the missing values in the column labeled Margin of Victory?

- (A) 1
  - (B) 2
  - (C) 3
  - (D) 4
  - (E) 5
22. If the average (arithmetic mean) of three different positive integers is 70, what is the greatest possible value of one of the integers?
23. For which of the following sets of numbers is the average (arithmetic mean) greater than the median?
- (A) { 1, 2, 3, 4, 5 }
  - (B) { 1, 2, 3, 4, 6 }
  - (C) { 1, 3, 3, 3, 5 }
  - (D) { - 1, 2, 3, 4, 5 }
  - (E) { - 1, 2, 3, 4, 5 }

24.

Quiz Score	Number of Students Who Received That Score
0	3
1	6
2	7
3	4

A class of 20 students took a 3-question quiz. The table shows the possible scores on this quiz and the number of students who received each of these scores.

What is the average (arithmetic mean) of the scores for this class?

- (A) 1.0
  - (B) 1.5
  - (C) 1.6
  - (D) 1.9
  - (E) 2.0
25. In a set of eleven different numbers, which of the following CANNOT affect the value of the median?
- (A) Doubling each number
  - (B) Increasing each number by 10
  - (C) Increasing the smallest number only
  - (D) Decreasing the largest number only
  - (E) Increasing the largest number only
26. The average (arithmetic mean) of 3 numbers is 60. If two of the numbers are 50 and 60, what is the third number?
- (A) 50
  - (B) 55
  - (C) 60
  - (D) 65
  - (E) 70
27. If the average (arithmetic mean) of  $x$ ,  $2x - 8$ ,  $2x + 2$ ,  $3x - 1$ , and  $4x + 1$  is 6, what is the value of the mode of these numbers?

28. The average (arithmetic mean) of nine numbers is 9. When a tenth number is added, the average of the ten numbers is also 9. What is the tenth number?
- (A) 0
- (B)  $\frac{9}{10}$
- (C)  $\frac{10}{9}$
- (D) 9
- (E) 10
29. Roberta rode her bicycle a total of 169 miles in 13 days. Each day after the first day she rode 1 mile farther than the day before. What was the difference between the average (arithmetic mean) number of miles she rode per day and the median number of miles she rode during the 13 days?
30. The average (arithmetic mean) of  $a$ ,  $b$ , and  $c$  is equal to the median of  $a$ ,  $b$ , and  $c$ . If  $0 < a < b < c$ , which of the following must be equal to  $b$ ?
- (A)  $\frac{a + c}{2}$
- (B)  $\frac{a + c}{3}$
- (C)  $\frac{c - a}{2}$
- (D)  $\frac{c - a}{3}$
- (E)  $\sqrt{ac}$

31. One adult and 10 children are in an elevator. If the adult's weight is 4 times the average (arithmetic mean) weight of the children, then the adult's weight is what fraction of the total weight of the 11 people in the elevator?

32.

NUMBER OF SIBLINGS PER STUDENT  
IN A PRESCHOOL CLASS

Number of Siblings	Number of Students
0	3
1	6
2	2
3	1

The table above shows how many students in a class of 12 preschoolers had 0, 1, 2, or 3 siblings. Later, a new student joined the class, and the average (arithmetic mean) number of siblings per student became equal to the median number of siblings per student. How many siblings did the new student have?

- (A) 0  
(B) 1  
(C) 2  
(D) 3  
(E) 4
33. The sum of four consecutive odd integers  $w$ ,  $x$ ,  $y$ , and  $z$  is 24. What is the median of the set  $\{w, x, y, x, 24\}$  ?
- (A) 3  
(B) 5  
(C) 7  
(D) 9  
(E) 24

34. In a certain game, each of 5 players received a score between 0 and 100, inclusive. If their average (arithmetic mean) score was 80, what is the greatest possible number of the 5 players who could have received a score of 50?
- (A) None
  - (B) One
  - (C) Two
  - (D) Three
  - (E) Four
35. A list of 100 integers has the property that the average (arithmetic mean),  $a$ , of the integers is greater than the median,  $m$ , of the integers. Which of the following must be true?
- I. More of these integers are greater than  $a$  than are less than  $a$ .
  - II. More of these integers are greater than  $m$  than are less than  $m$ .
  - III. More of these integers are less than  $m$  than are greater than  $m$ .
- (A) None
  - (B) I only
  - (C) II only
  - (D) I and II
  - (E) I and III