

Statistics

Data & Measurement · Grade 6

Score: _____ / 15

★ Hard · 15 Questions

Solve each problem. Show your work in the space provided. Write your answer on the line.

1. The mean of n numbers is 40. When a new number 70 is added, the mean becomes 45. Find n .

Answer: _____

2. Find the mean of the first 20 positive even numbers.

Answer: _____

3. A dataset {10,20,30,40,50}: each value is increased by 5. What happens to the mean and standard deviation?

Answer: _____

4. Scores: 55,60,65,70,75,80,85. The score of 55 is replaced by 95. How does the mean change?

Answer: _____

5. Mean salary of 8 employees is \$45,000. A new employee earning \$65,000 joins. New mean salary?

Answer: _____

6. Data: 12, 15, 18, 21, 24. Find the population variance and standard deviation.

Answer: _____

7. If all values in a dataset are multiplied by 3, what happens to the mean, median, and range?

Answer: _____

8. A class of 30 students: 12 scored 70, 10 scored 80, 8 scored 90. Find the mean.

Answer: _____

9. The mean of 5 numbers is 10 and the mean of another 5 is 20. What is the mean of all 10?

Answer: _____

10. Five numbers have mean 16. The numbers in order include 12, 12, 14, and two unknowns ≥ 14 . Find all five numbers.

Answer: _____

11. The mean of 9 values is 42. One value of 100 is added. How does the median change?

Answer: _____

- 12.** Five-number summary: Min=10, Q1=25, Median=40, Q3=60, Max=90. Find IQR and check for outliers ($1.5 \times \text{IQR}$ rule).

Answer: _____

- 13.** Dataset A: all values equal to 50. Mean=50, SD=?

Answer: _____

- 14.** Ages of 7 children: 8,10,9,12,8,11,10. Calculate the mean absolute deviation (MAD).

Answer: _____

- 15.** A student's 4 test scores (each out of 100) are 88, 72, 95, and 81. What is the minimum score on a 5th test to maintain a mean ≥ 85 ?

Answer: _____

Answer Key

Statistics — Hard

1. **$n = 5$**

$40n + 70 = 45(n + 1)$. $40n + 70 = 45n + 45$. $25 = 5n$. $n = 5$.

2. **21**

First 20 evens: 2, 4, ..., 40. $\text{Sum} = 20 \times 21 = 420$. $\text{Mean} = 420 \div 20 = 21$.

3. **Mean increases by 5 (to 35); standard deviation is unchanged.**

Adding a constant shifts the mean but doesn't change the spread.

4. **Mean increases by $40 \div 7 \approx 5.71$**

Original mean = 70. New sum adds 40. New mean = $530 \div 7 \approx 75.71$. Increase ≈ 5.71 .

5. **$\approx \$47,222$**

Old sum = 360,000. New sum = 425,000. New mean = $425,000 \div 9 \approx 47,222$.

6. **Variance = 18; $\text{SD} = \sqrt{18} \approx 4.24$**

Mean = 18. Deviations: -6, -3, 0, 3, 6. Squared sum = 90. Variance = $90 \div 5 = 18$. $\text{SD} = \sqrt{18} \approx 4.24$.

7. **All three are multiplied by 3.**

Multiplying every value by k scales mean, median, and range by k .

8. **≈ 78.67**

Sum: $12 \times 70 + 10 \times 80 + 8 \times 90 = 840 + 800 + 720 = 2,360$. Mean = $2,360 \div 30 \approx 78.67$.

9. **15**

Sum of first 5: 50. Sum of second 5: 100. Total = $150 \div 10 = 15$.

10. **12, 12, 14, 19, 23**

Sum = 80. Known: $12 + 12 + 14 = 38$. Remaining: $80 - 38 = 42$. Values ≥ 14 summing to 42: $19 + 23 = 42$. ✓

11. New median = average of the 5th and 6th sorted values (depends on data).

With 10 values, median = (5th+6th)/2. 100 goes at the end. The 6th value is one above the old median.

12. IQR=35; fences: -27.5 to 112.5. No outliers.

IQR=60-25=35. Lower: 25-52.5=-27.5. Upper: 60+52.5=112.5. Min=10 and Max=90 are within bounds.

13. SD = 0

No variation. Every deviation from mean=0. Variance=0. SD=0.

14. MAD $\approx$ 1.14

Mean=68/7 $\approx$ 9.71. Deviations: 1.71,0.29,0.71,2.29,1.71,1.29,0.29. Sum $\approx$ 8. MAD=8 $\div$ 7 $\approx$ 1.14.

15. 89

Target sum=85 $\times$ 5=425. Current sum=336. Need 425-336=89.
