Data Displays Extended

Spot mistakes, reason, and work backward

Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

Line graphs preserve time order, bars compare categories, histograms group numerical intervals, and stem-and-leaf plots preserve exact values. Bins must not overlap: $0 \le x < 3$ excludes 3, and $3 \le x < 6$ includes it.

Worked example

A frequency table has counts $6, 8, 10$. Find the total and the share of the first group.

1. Add the counts: $6 + 8 + 10 = 24$.
2. The first group contains 6 of the 24 observations.
3. Simplify its share: $6/24 = 1/4$.
Answer: Total 24; first share $1/4$.

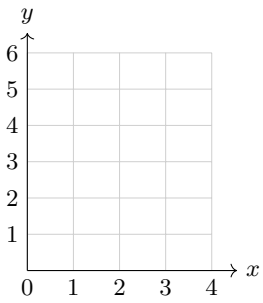
Practice Problems

Show your thinking.

1. A reading of exactly 10 minutes was counted in the second bin. Move it to the correct bin. Give the corrected frequencies in order and the corrected fraction below 10 minutes.

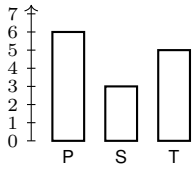
time (min)	frequency
$0 \le t < 5$	3
$5 \le t < 10$	7
$10 \le t < 15$	4
$15 \le t < 20$	2

2. A student sorts $(0, 2), (1, 5), (2, 4), (3, 4), (4, 6)$ by height before connecting them. Plot and connect them in time order instead. Give the flat interval and its reading.

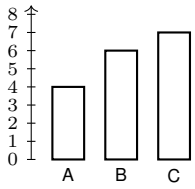


3. A survey reports 24 votes total. Three categories have counts $6, 8, 11$ and the fourth count is missing. Can a nonnegative fourth count work? Give the smallest possible corrected total.

4. The bars show lunch choices P, S, and T. A student draws a line through the bar tops and describes a change over time. Explain why that claim is unsupported. Give the leading choice and its lead over the next highest choice.



5. One vote moves from category C to category A. Give the three updated bar heights, the new leaders, and the updated total.



6. A grouped record shows 3 times from 10 to under 15 minutes, 1 from 15 to under 20, and 1 from 20 to under 25. Locate the median bin. Can the exact median be recovered? Support your answer with two possible datasets.

Answer Key

1. Move 10 to $10 \le t < 15$. Frequencies $3, 6, 5, 2$; below 10: $9/16$.
2. From time 2 to 3, the reading stays at 4; see graph below.
3. No. The total must be at least 25 votes.
4. P leads T by 1 vote. The categories are not time points.
5. A 5, B 6, C 6; B and C tie. Total 17 votes.
6. Median is in the first bin, but is not determined. For example, medians 12 and 14 both fit.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The bin $5 \le t < 10$ excludes its upper endpoint; $10 \le t < 15$ includes 10.

2. Move one observation: the second count is $7 - 1 = 6$ and the third is $4 + 1 = 5$.

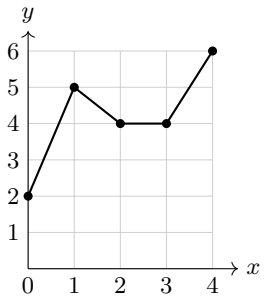
3. Total stays $3 + 6 + 5 + 2 = 16$. Now $3 + 6 = 9$ readings are below 10, giving $9/16$.

Problem 2

1. Place time on the horizontal axis. Connect the points in order of $x = 0, 1, 2, 3, 4$.

2. The readings at $x = 2$ and $x = 3$ are both 4; the change is $4 - 4 = 0$.

3. All other consecutive readings differ. Only the segment from time 2 to 3 is flat.



Problem 3

1. The three known counts alone total $6 + 8 + 11 = 25$.

2. A total of 24 would require a fourth count of $24 - 25 = -1$, which is not possible.

3. With 0 in the fourth category, the smallest total is $25 + 0 = 25$.

Problem 4

1. The 3 labels name choices, not times, so changing their order would change the line but not the data.

2. P has 6 votes, S has 3, and T has 5.

3. The top two are P and T; the lead is $6 - 5 = 1$ vote.

Problem 5

1. Originally the counts are A 4, B 6, and C 7.

2. A increases to $4 + 1 = 5$ and C drops to $7 - 1 = 6$. B stays at 6.

3. The highest count is now 6 in both B and C. The total stays $5 + 6 + 6 = 17$.

Problem 6

1. There are $3 + 1 + 1 = 5$ times. The median is at position $(5 + 1)/2 = 3$, still in the first bin.

2. The data $10, 11, 12, 17, 23$ match the bin counts and have median 12.

3. The data $11, 12, 14, 17, 23$ also match and have median 14. A grouped display does not retain exact values.

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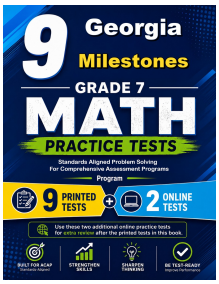

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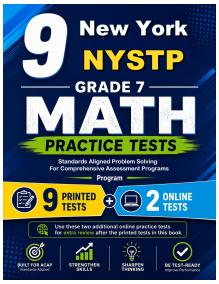

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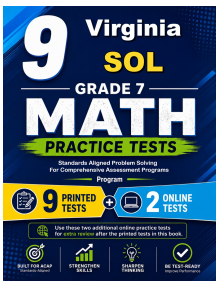

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