Data Displays Extended

Explore ideas and representations

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 $1/4$.

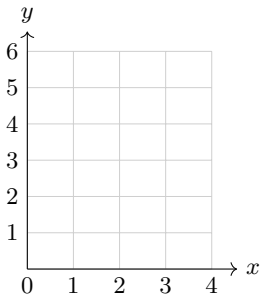
Practice Problems

Show your thinking.

1. Use the interval frequencies to find the total number of observations and the fraction below 10 minutes.

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

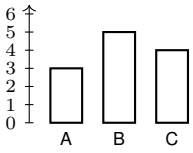
2. Plot $(0, 1), (1, 3), (2, 2), (3, 5), (4, 4)$ with time on the horizontal axis. Connect them in time order. Give the largest one-step increase and its interval.



3. Category counts are $4, 7, x, 5$ with total 23. Find x and its fraction of the total.

4. Counts 20 and 24 are shown by bars with a baseline of 18. Compare the larger-to-smaller ratio of the actual counts with the larger-to-smaller ratio of the visible bar heights.

5. Read the bars. Find the total votes and how many more votes B has than A.



6. Use a stem-and-leaf plot to preserve the values $12, 14, 14, 18, 22$. Give the rows, a key, and the median.

Answer Key

1. Total 15; fraction below 10 is $3/5$.
2. Largest increase 3, from time 2 to 3; see the graph below.
3. $x = 7$; fraction $7/23$.
4. True ratio $6/5$; visible-height ratio 3.
5. Total 12 votes; B has 2 more than A.
6. $1|2\ 4\ 4\ 8$; $2|2$. Key $1|2 = 12$; median 14.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Add all four frequencies: $4 + 5 + 4 + 2 = 15$.

2. The first two bins end before 10 and contain $4 + 5 = 9$ observations.

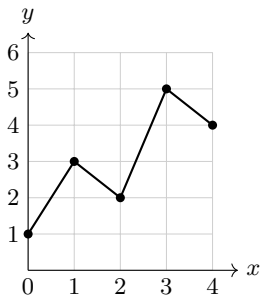
3. The fraction is $9/15 = 3/5$. Exactly 10 belongs to the third bin.

Problem 2

1. Plot the five points from $x = 0$ through $x = 4$ and connect consecutive times, not consecutive heights.

2. The changes are $3 - 1 = 2$, $2 - 3 = -1$, $5 - 2 = 3$, and $4 - 5 = -1$.

3. The greatest increase is 3 from time 2 to time 3.



Problem 3

1. The known counts total $4 + 7 + 5 = 16$.

2. The missing count is $23 - 16 = 7$. Check $4 + 7 + 7 + 5 = 23$.

3. The missing category holds 7 out of 23 observations.

Problem 4

1. The actual counts have ratio $24/20 = 6/5$.

2. The truncated heights are $20 - 18 = 2$ and $24 - 18 = 6$.

3. Their ratio is $6/2 = 3$, which exaggerates the count ratio.

Problem 5

1. The heights of A, B, and C give counts $3, 5, 4$.

2. Total votes are $3 + 5 + 4 = 12$.

3. B has $5 - 3 = 2$ more votes than A.

Problem 6

1. Tens are stems: $12, 14, 14, 18$ use stem 1, and 22 uses stem 2.

2. Ones give leaves $2, 4, 4, 8$ on stem 1 and leaf 2 on stem 2. Both copies of 14 stay.

3. With 5 ordered values, the median is at $(5 + 1)/2 = 3$, which is 14. Key: $1|2 = 12$.

stem	leaves
1	2 4 4 8
2	2

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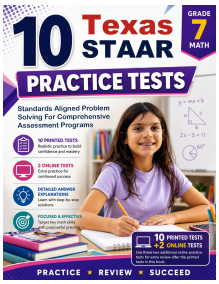

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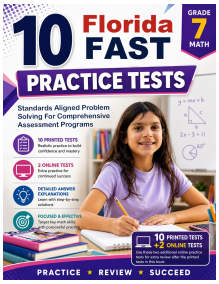

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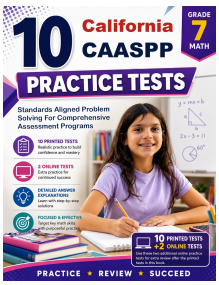

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