Stem-and-Leaf Plots

Stem-and-Leaf Plots: Apply, Compare, and Design

Name _____ **Date** _____ **Score** _____ / 8

QUICK REVIEW

Read the key before decoding a row. Each leaf is one observation, even when two leaves match. Keep leaves sorted within each stem. Range is the greatest value minus the least.

Worked example

With key $2 \mid 3 = 23$ min, the rows are $1 \mid 7\ 8$, $2 \mid 0\ 3\ 8\ 9$, and $3 \mid 5$. A schedule needs three times from 20 through 29 min. How many options are left over?

1. Stem 2 gives $20, 23, 28, 29$ min, or 4 options in the interval.
2. The schedule takes 3 of the 4, leaving $4 - 3 = 1$.
Answer: 1 option left over.

Practice Problems

Show your thinking.

1. The columns show times for groups A and B. Which group has the wider range, and by how much?

Stem	A	B
1	8	
2	0 5	1 4
3	2	0 6

Key: $2 \mid 1 = 21$ min

2. A session meets the schedule if it takes at most 28 min. How many qualify and how many exceed the limit? Do at least half qualify?

Stem	Leaves
2	1 6 8 9
3	0 2 5

Key: $2 \mid 8 = 28$ min

3. Add one more 24 min session and one new longest session to make the range exactly 20 min. Find the new longest time and show the two changed rows.

Stem	Leaves
1	8
2	0 4 9
3	2

Key: $2 \mid 4 = 24$ min

4. Combine classes A and B. Give the new stem 3 row and the fraction of all sessions at least 30 min.

Stem	A	B
1	8	
2	6	4 8
3	2 7	0 2
4		1

Key: $3 \mid 2 = 32$ min

5. Remove the longest session to make a second summary. Find both ranges and how much the range decreases.

Stem	Leaves
1	6 9
2	1 7
3	0 3
4	8

Key: $4 \mid 8 = 48$ min

6. Choose the three shortest activities in the plot for a 60 min block. List their times and find any unused minutes.

Stem	Leaves
1	6 9
2	4 5 9
3	3 4

Key: $2 \mid 4 = 24$ min

7. Which group has the greater fraction of sessions of at least 30 min? Show both fractions.

Stem	A	B
1	2 7	1 4 8
2	4	2 4 9
3	0 2 4	1 4 8
4		0

Key: $3 \mid 0 = 30$ min

8. Add either 31 min or 36 min. Which choice keeps the range unchanged and creates a single most frequent time? Give its frequency.

Stem	Leaves
2	2 5 5
3	1 1 4

Key: $3 \mid 1 = 31$ min

Answer Key

1. B; its range is 1 min wider.
2. 3 qualify; 4 exceed. No, fewer than half qualify.
3. 38 min; $2 \mid 0\ 4\ 4\ 9$ and $3 \mid 2\ 8$.
4. $3 \mid 0\ 2\ 2\ 7$; $\frac{5}{9}$ of sessions.
5. Old range 32 min; new range 17 min; decrease 15 min.
6. $16, 19, 24$ min; 1 min unused.
7. A: $\frac{1}{2}$; B: $\frac{2}{5}$. A has the greater share.
8. Add 31 min; it occurs 3 times.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. A runs from 18 to 32 min: $32 - 18 = 14$ min.
2. B runs from 21 to 36 min: $36 - 21 = 15$ min. Difference: $15 - 14 = 1$ min.

Problem 2

1. $21, 26, 28$ min qualify. The other $7 - 3 = 4$ exceed the limit.
2. Double the qualifying count: $2 \times 3 = 6 < 7$, so fewer than half qualify.

Problem 3

1. The shortest stays 18 min, so the required longest is $18 + 20 = 38$ min.
2. Add leaf 4 under stem 2 and leaf 8 under stem 3. The range is $38 - 18 = 20$ min.

Problem 4

1. Combine $32, 37$ with $30, 32$ to get $30, 32, 32, 37$ min in stem 3.
2. Stem 4 adds 1 qualifying time. There are $4 + 5 = 9$ times in all, so the fraction is $\frac{4+1}{9} = \frac{5}{9}$.

Problem 5

1. The first and last times are 16 and 48 min: $48 - 16 = 32$ min.
2. With 48 removed, the new largest is 33 min. The range is $33 - 16 = 17$ min.
3. The range decreases by $32 - 17 = 15$ min.

Problem 6

1. The first three leaves give $16, 19, 24$ min.
2. They take $16 + 19 + 24 = 59$ min, leaving $60 - 59 = 1$ min.

Problem 7

1. A has 3 qualifying sessions out of 6, so $\frac{3}{6} = \frac{1}{2}$.
2. B has 4 qualifying sessions out of 10, so $\frac{4}{10} = \frac{2}{5}$.
3. Compare $\frac{5}{10} > \frac{4}{10}$. A has the greater fraction.

Problem 8

1. The range is $34 - 22 = 12$ min. Adding 36 would make it $36 - 22 = 14$ min.
2. Adding 31 keeps both endpoints and changes its count from 2 to 3, more than any other time.

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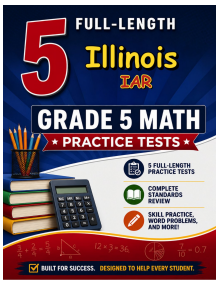

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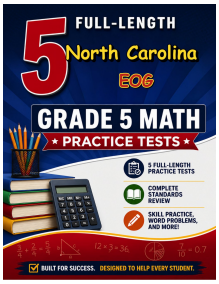

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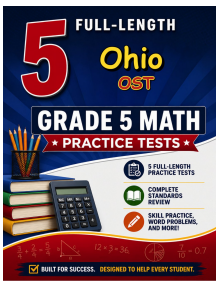

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