Stem-and-Leaf Plots

Apply the skill to decisions and designs

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

QUICK REVIEW

Read place value from the key: $5|2 = 52$ uses tens and ones. Sort leaves within each stem. Each leaf represents one observation, even if a digit or a value repeats.

Worked example

Read $5|2\ 5\ 5$ and $6|0$ with key $5|2 = 52$. Find how many values exceed 53.

1. Stem 5 gives $52, 55, 55$; stem 6 gives 60.
2. Keep both leaves 5 in stem 5: both values of 55 exceed 53.
3. The 60 also exceeds 53. The count is $2 + 1 = 3$.
Answer: 3 values exceed 53.

Practice Problems

Show your thinking.

1. A wait-time plot gets two new readings, 20 and 39 minutes. Update the rows. Are at least half the updated waits under 25 minutes? Give the fraction. Key $2|3 = 23$.

stem	leaves
1	7 9
2	1 4 4 8
3	4

2. The back-to-back plot shows travel minutes for two routes. Find each median and count trips of at least 30 minutes. Choose a route if avoiding those long trips matters most. On either side, stem 2 with leaf 3 means 23.

A leaves	stem	B leaves
8	1	9
2 1 0	2	3 4 5 8
4	3	–

3. A recorded 32 should have been 23. State the leaf to move. How do the median and range change after the correction? Key $2|3 = 23$.

stem	leaves
1	4 8
2	1 3 8
3	2

4. This plot is missing one of five scores. The complete set has median 22. Recover the missing score and tell exactly where to put its leaf. Key $2|3 = 23$.

stem	leaves
1	1 6
2	5
3	3

5. A display must show the gap between readings $17, 12, 18, 43, 41, 42$. Build a keyed plot with every stem from 1 to 4, even if empty. How far apart are the two nearest readings across the gap?

6. There are two certificates for the highest test scores. Can scores alone pick two winners without leaving out a tie at the top? Give the highest score and how many certificates would cover all top scorers. Key $2|3 = 23$.

stem	leaves
1	8
2	2 2 2 2
3	1 8 8 8

Answer Key

1. $1|7\ 9$; $2|0\ 1\ 4\ 4\ 8$; $3|4\ 9$. Yes, $6/9 = 2/3$ are under 25.
2. A: median 21, 1 long trip. B: median 24, 0 long trips. Choose B.
3. Remove $3|2$ and add $2|3$. Median stays 22; range falls from 18 to 14.
4. Score 22; insert leaf 2 before leaf 5 on stem 2.
5. $1|2\ 7\ 8$ and $4|1\ 2\ 3$; stems $2, 3$ empty. Key $1|2 = 12$; gap 23.
6. No. The highest score is 38, and 3 certificates are needed.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Add leaf 0 to stem 2 for 20 and leaf 9 to stem 3 for 39, keeping the leaves ordered.

2. The new total is $7 + 2 = 9$. Both teens and $20, 21, 24, 24$ are below 25, so $2 + 4 = 6$ qualify.

3. The share is $6/9 = 2/3 > 1/2$.

stem	leaves
1	7 9
2	0 1 4 4 8
3	4 9

Problem 2

1. Route A gives $18, 20, 21, 22, 34$ and Route B gives $19, 23, 24, 25, 28$.

2. Each has 5 values, so position $(5 + 1)/2 = 3$ gives medians 21 and 24.

3. Only Route A has a leaf on stem 3: 34. Route B avoids the 30-minute threshold despite its higher median.

Problem 3

1. Change 32 to 23 by removing leaf 2 from stem 3 and inserting another leaf 3 in stem 2.

2. The middle values are $21, 23$ both before and after, so the median stays $(21 + 23)/2 = 22$.

3. The maximum falls from 32 to 28. The minimum stays 14, so the range changes from $32 - 14 = 18$ to $28 - 14 = 14$.

Problem 4

1. With 5 values, median 22 must be an actual observation at position $(5 + 1)/2 = 3$.

2. The four printed values are $11, 16, 25, 33$. None is 22, and adding 22 between 16 and 25 puts it third.

3. Stem 2 and leaf $22 - 20 = 2$ encode the missing value. Insert it before the existing leaf 5.

Problem 5

1. The lower group is $12, 17, 18$, so put leaves $2, 7, 8$ on stem 1.

2. The upper group is $41, 42, 43$, so put leaves $1, 2, 3$ on stem 4. Keep stems 2 and 3 empty to show the gap.

3. The nearest values across the gap are 18 and 41, a difference of $41 - 18 = 23$. Use key $1|2 = 12$.

stem	leaves
1	2 7 8
2	–
3	–
4	1 2 3

Problem 6

1. Stem 3 and its largest leaf 8 give the top score $3(10) + 8 = 38$.

2. There are 3 copies of leaf 8 on stem 3, so three students share that score.

3. Giving only 2 certificates would leave out $3 - 2 = 1$ student with the same top score.

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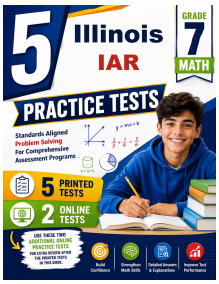

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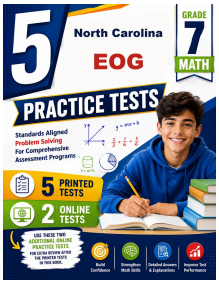

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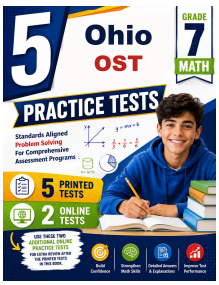

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