Solving Problems Using Line Plots

Solving Problems Using Line Plots: Models and Computation

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

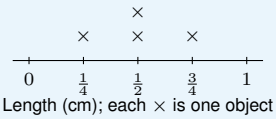
QUICK REVIEW

Each mark represents one measured object. To find combined length, multiply each tick value by its frequency, then add. Two objects of $\frac{1}{2}$ cm and three of $\frac{3}{4}$ cm have total $2 \times \frac{1}{2} + 3 \times \frac{3}{4} = \frac{13}{4}$ cm, not merely 5 cm.

Worked example

Find the combined length of all the objects in the line plot.

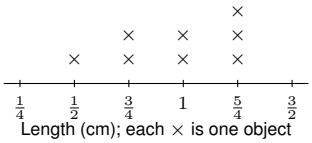
1. Count marks at each occupied tick: $\frac{1}{4}$: 1, $\frac{1}{2}$: 2, $\frac{3}{4}$: 1.
2. Object count: $1 + 2 + 1 = 4$.
3. Add measured lengths, not just marks: $1 \times \frac{1}{4} + 2 \times \frac{1}{2} + 1 \times \frac{3}{4} = 2$ cm.
Answer: 2 cm.



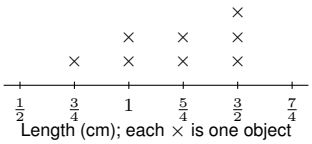
Practice Problems

Show your thinking.

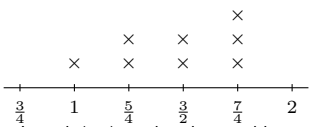
1. Find the combined length of all the objects in the line plot.



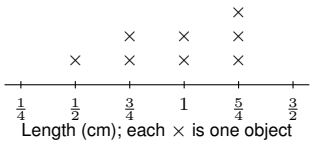
2. Find the difference between the longest and shortest lengths. Include the unit.



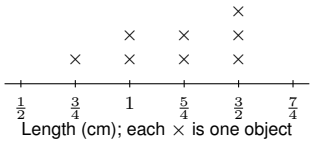
3. Find the combined length of all $\frac{7}{4}$ cm objects and all 1 cm objects. How much greater is the first combined length?



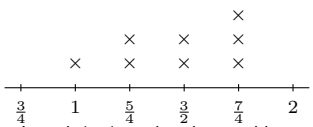
4. One object of length $\frac{5}{4}$ cm is removed. Find the total length and object count that remain.



5. A student counts 9 objects in this plot. Find the correct count and explain the error using the counts at each tick.



6. All object lengths are joined, then cut into 8 equal pieces. Find one new piece's length.



Answer Key

1. $\frac{31}{4}$ cm.
2. $\frac{3}{4}$ cm.
3. $\frac{21}{4}$ cm and 1 cm; difference $\frac{17}{4}$ cm.
4. $\frac{13}{2}$ cm; 7 objects.
5. 8 objects, not 9.
6. $\frac{47}{32}$ cm each.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Count marks at each occupied tick: $\frac{1}{2}$: 1, $\frac{3}{4}$: 2, 1: 2, $\frac{5}{4}$: 3.
2. Object count: $1 + 2 + 2 + 3 = 8$.
3. Add measured lengths, not just marks:
$1 \times \frac{1}{2} + 2 \times \frac{3}{4} + 2 \times 1 + 3 \times \frac{5}{4} = \frac{31}{4}$ cm.

Problem 2

1. Count marks at each occupied tick: $\frac{3}{4}$: 1, 1: 2, $\frac{5}{4}$: 2, $\frac{3}{2}$: 3.
2. Object count: $1 + 2 + 2 + 3 = 8$.
3. Longest minus shortest: $\frac{3}{2} - \frac{3}{4} = \frac{3}{4}$ cm.

Problem 3

1. Count marks at each occupied tick: 1: 1, $\frac{5}{4}$: 2, $\frac{3}{2}$: 2, $\frac{7}{4}$: 3.
2. Object count: $1 + 2 + 2 + 3 = 8$.
3. Longest group: $3 \times \frac{7}{4} = \frac{21}{4}$ cm; shortest group: $1 \times 1 = 1$ cm.
4. First minus second: $\frac{21}{4} - 1 = \frac{17}{4}$ cm.

Problem 4

1. Count marks at each occupied tick: $\frac{1}{2}$: 1, $\frac{3}{4}$: 2, 1: 2, $\frac{5}{4}$: 3.
2. Object count: $1 + 2 + 2 + 3 = 8$.
3. Add measured lengths, not just marks:
$1 \times \frac{1}{2} + 2 \times \frac{3}{4} + 2 \times 1 + 3 \times \frac{5}{4} = \frac{31}{4}$ cm.
4. Length left: $\frac{31}{4} - \frac{5}{4} = \frac{13}{2}$ cm; count $8 - 1 = 7$.

Problem 5

1. Count marks at each occupied tick: $\frac{3}{4}$: 1, 1: 2, $\frac{5}{4}$: 2, $\frac{3}{2}$: 3.
2. Object count: $1 + 2 + 2 + 3 = 8$.

Problem 6

1. Count marks at each occupied tick: 1: 1, $\frac{5}{4}$: 2, $\frac{3}{2}$: 2, $\frac{7}{4}$: 3.
2. Object count: $1 + 2 + 2 + 3 = 8$.
3. Add measured lengths, not just marks:
$1 \times 1 + 2 \times \frac{5}{4} + 2 \times \frac{3}{2} + 3 \times \frac{7}{4} = \frac{47}{4}$ cm.
4. Equal length: $\frac{47}{4} \div 8 = \frac{47}{32}$ cm; check $8 \times \frac{47}{32} = \frac{47}{4}$.

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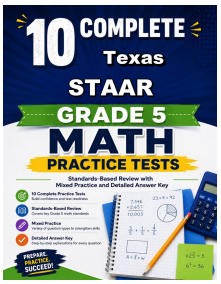

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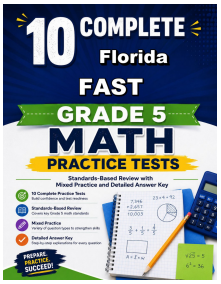

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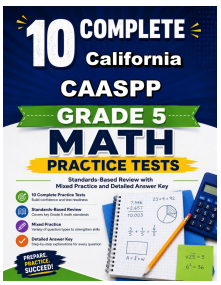

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