Line Plots with Fractional Data

Line Plots with Fractional Data: Apply, Compare, and Design

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

QUICK REVIEW

A line plot places one mark over a number-line tick for each measurement. For $\frac{1}{2}$, $\frac{1}{2}$, $\frac{3}{4}$ cm, put two marks over $\frac{1}{2}$ and one over $\frac{3}{4}$. Equal tick spacing represents equal fractional differences; the total mark count is 3.

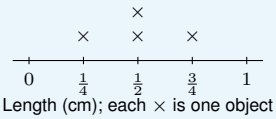
Worked example

Use the line plot to find the total number of objects and the number of objects of length $\frac{1}{2}$ cm.

1. Count marks at each occupied tick: $\frac{1}{4}$: 1, $\frac{1}{2}$: 2, $\frac{3}{4}$: 1.

2. Object count: $1 + 2 + 1 = 4$.

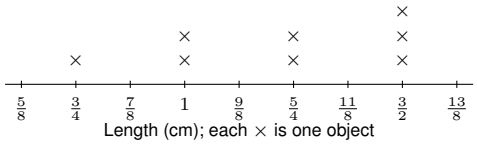
Answer: 4 objects; 2 at $\frac{1}{2}$ cm.



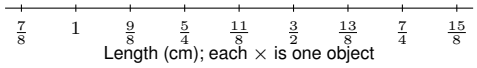
Practice Problems

Show your thinking.

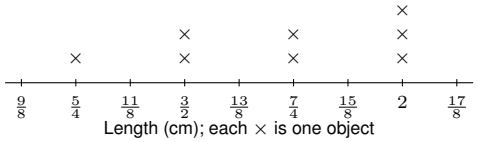
1. One new object of length $\frac{3}{2}$ cm is added. Draw its extra mark on the given plot and find the new total length.



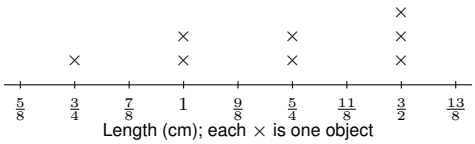
2. Make a line plot of these lengths in centimeters: $1, \frac{5}{4}, \frac{5}{4}, \frac{3}{2}, \frac{3}{2}, \frac{7}{4}, \frac{7}{4}, \frac{7}{4}$. Use one $\times$ per object on the blank axis.



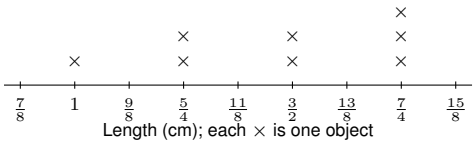
3. Which length or lengths occur most often? How many objects have each of those lengths?



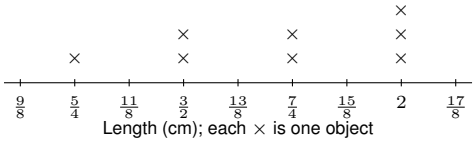
4. Find the combined length of all the objects in the line plot.



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



6. How many objects are strictly longer than $\frac{7}{4}$ cm? Give that count as a fraction of all objects.



Answer Key

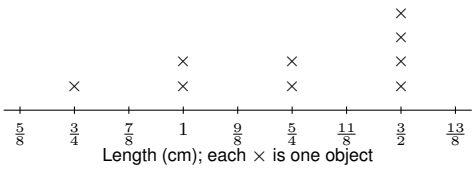
1. One extra mark at $\frac{3}{2}$ cm; total $\frac{45}{4}$ cm.
2. Place 1: 1, $\frac{5}{4}$: 2, $\frac{3}{2}$: 2, $\frac{7}{4}$: 3 marks at the respective lengths.
3. 2 cm; 3 objects at each.
4. $\frac{39}{4}$ cm.
5. $\frac{3}{4}$ cm.
6. 3 objects; fraction $\frac{3}{8}$.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

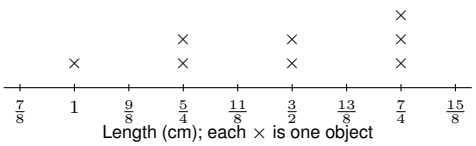
1. Count marks at each occupied tick: $\frac{3}{4}$: 1, 1: 2, $\frac{5}{4}$: 2, $\frac{3}{2}$: 3.
2. Object count: $1+2+2+3=8$.
3. Add measured lengths, not just marks: $1\times\frac{3}{4}+2\times1+2\times\frac{5}{4}+3\times\frac{3}{2}=\frac{39}{4}$ cm.
4. New total: $\frac{39}{4}+\frac{3}{2}=\frac{45}{4}$ cm.



Length (cm); each × is one object

Problem 2

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. Place the marks above their length ticks, not at heights equal to their lengths. The plot contains 8 marks.



Length (cm); each × is one object

Problem 3

1. Count marks at each occupied tick: $\frac{5}{4}$: 1, $\frac{3}{2}$: 2, $\frac{7}{4}$: 2, 2: 3.
2. Object count: $1+2+2+3=8$.
3. The largest frequency is 3, attained at 2 cm.

Problem 4

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. Add measured lengths, not just marks: $1\times\frac{3}{4}+2\times1+2\times\frac{5}{4}+3\times\frac{3}{2}=\frac{39}{4}$ cm.

Problem 5

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 minus shortest: $\frac{7}{4}-1=\frac{3}{4}$ cm.

Problem 6

1. Count marks at each occupied tick: $\frac{5}{4}$: 1, $\frac{3}{2}$: 2, $\frac{7}{4}$: 2, 2: 3.
2. Object count: $1+2+2+3=8$.
3. Count only marks right of $\frac{7}{4}$: 3. Fraction $\frac{3}{8}=\frac{3}{8}$.

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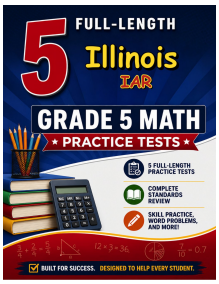

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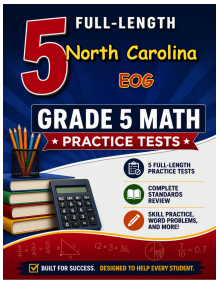

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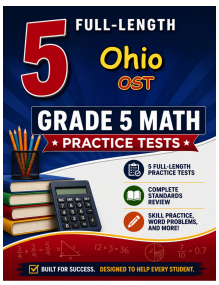

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