# Solving Problems Using Line Plots

Solving Problems Using Line Plots: Find, Fix, and Work Backward

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

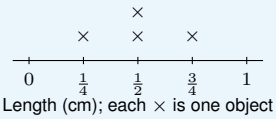
**QUICK REVIEW**

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.

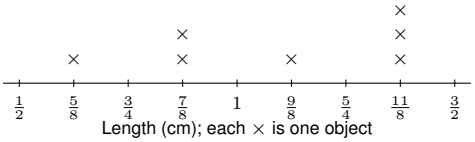
**1.** Count marks at each occupied tick: $\frac{1}{4}$: 1, $\frac{1}{2}$: 2, $\frac{3}{4}$: 1.
**2.** Object count: $1 + 2 + 1 = 4$.
**3.** Add measured lengths, not just marks: $1 \times \frac{1}{4} + 2 \times \frac{1}{2} + 1 \times \frac{3}{4} = 2$ cm.
**Answer:** $2$ cm.



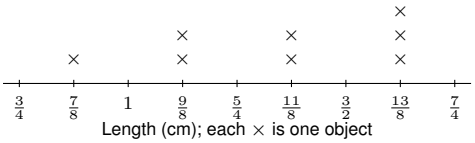

## Practice Problems

Show your thinking.

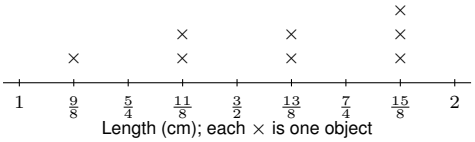
**1.** One mark is missing from this plot. Use the length data in cm, $\frac{5}{8}, \frac{7}{8}, \frac{7}{8}, \frac{9}{8}, \frac{9}{8}, \frac{11}{8}, \frac{11}{8}, \frac{11}{8}$, to find and add the missing mark. Then find the corrected total length.



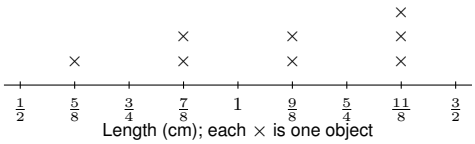

**2.** A student counts $9$ objects in this plot. Find the correct count and explain the error using the counts at each tick.



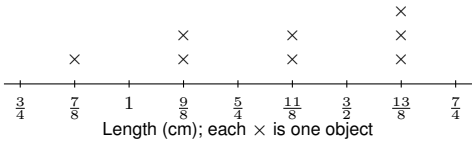

**3.** All object lengths are joined, then cut into $8$ equal pieces. Find one new piece's length.



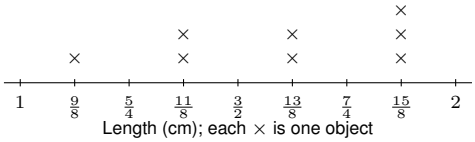

**4.** Find the combined length of all $\frac{11}{8}$ cm objects and all $\frac{5}{8}$ cm objects. How much greater is the first combined length?




**5.** One object of length $\frac{13}{8}$ cm is removed. Find the total length and object count that remain.




**6.** After one object is removed, the combined length is $\frac{89}{8}$ cm. Find the removed object's length by using the original plot.



# Answer Key

1. Add one mark at $\frac{9}{8}$ cm; total $\frac{35}{4}$ cm.
2. $8$ objects, not $9$.
3. $\frac{51}{32}$ cm each.
4. $\frac{33}{8}$ cm and $\frac{5}{8}$ cm; difference $\frac{7}{2}$ cm.
5. $\frac{73}{8}$ cm; 7 objects.
6. $\frac{13}{8}$ cm.

## Step-by-Step Solutions

Follow each calculation, then check your own work.

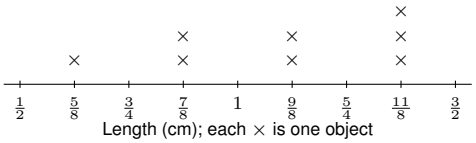
### Problem 1

**1.** The data list $2$ lengths of $\frac{9}{8}$ cm, but the given plot has $1$. Add one mark there.

**2.** Count marks at each occupied tick: $\frac{5}{8}$: 1, $\frac{7}{8}$: 2, $\frac{9}{8}$: 2, $\frac{11}{8}$: 3.

**3.** Object count: $1+2+2+3=8$.

**4.** Add measured lengths, not just marks: $1\times\frac{5}{8}+2\times\frac{7}{8}+2\times\frac{9}{8}+3\times\frac{11}{8}=\frac{35}{4}$ cm.



Length (cm); each × is one object

### Problem 2

**1.** Count marks at each occupied tick: $\frac{7}{8}$: 1, $\frac{9}{8}$: 2, $\frac{11}{8}$: 2, $\frac{13}{8}$: 3.

**2.** Object count: $1+2+2+3=8$.

### Problem 3

**1.** Count marks at each occupied tick: $\frac{9}{8}$: 1, $\frac{11}{8}$: 2, $\frac{13}{8}$: 2, $\frac{15}{8}$: 3.

**2.** Object count: $1+2+2+3=8$.

**3.** Add measured lengths, not just marks: $1\times\frac{9}{8}+2\times\frac{11}{8}+2\times\frac{13}{8}+3\times\frac{15}{8}=\frac{51}{4}$ cm.

**4.** Equal length: $\frac{51}{4}\div 8=\frac{51}{32}$ cm; check $8\times\frac{51}{32}=\frac{51}{4}$.

### Problem 4

**1.** Count marks at each occupied tick: $\frac{5}{8}$: 1, $\frac{7}{8}$: 2, $\frac{9}{8}$: 2, $\frac{11}{8}$: 3.

**2.** Object count: $1+2+2+3=8$.

**3.** Longest group: $3\times\frac{11}{8}=\frac{33}{8}$ cm; shortest group: $1\times\frac{5}{8}=\frac{5}{8}$ cm.

**4.** First minus second: $\frac{33}{8}-\frac{5}{8}=\frac{7}{2}$ cm.

### Problem 5

**1.** Count marks at each occupied tick: $\frac{7}{8}$: 1, $\frac{9}{8}$: 2, $\frac{11}{8}$: 2, $\frac{13}{8}$: 3.

**2.** Object count: $1+2+2+3=8$.

**3.** Add measured lengths, not just marks: $1\times\frac{7}{8}+2\times\frac{9}{8}+2\times\frac{11}{8}+3\times\frac{13}{8}=\frac{43}{4}$ cm.

**4.** Length left: $\frac{43}{4}-\frac{13}{8}=\frac{73}{8}$ cm; count $8-1=7$.

### Problem 6

**1.** Count marks at each occupied tick: $\frac{9}{8}$: 1, $\frac{11}{8}$: 2, $\frac{13}{8}$: 2, $\frac{15}{8}$: 3.

**2.** Object count: $1+2+2+3=8$.

**3.** The original combined length is $1\times\frac{9}{8}+2\times\frac{11}{8}+2\times\frac{13}{8}+3\times\frac{15}{8}=\frac{51}{4}$ cm.

**4.** Removed length: $\frac{51}{4}-\frac{89}{8}=\frac{13}{8}$ cm.

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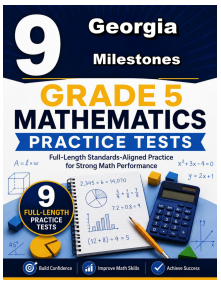


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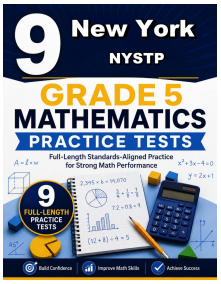


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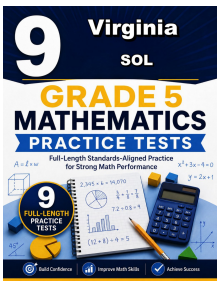


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