

Line Plots with Fractions

Grade 5 Math • Section 8.4

Name: _____

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Quick Review and Helpful Hints

Line plot: A number line with X's (or dots) above each value to show frequency. Each X represents one data point.

With fractions: Mark the number line with fractions ($\frac{1}{8}, \frac{1}{4}, \frac{3}{8}, \frac{1}{2}, \dots$) and place an X for each measurement.

Use fraction operations to answer questions: total, difference, most/least common values.

Example: A set of data shows plant heights (in inches): $\frac{1}{4}, \frac{1}{2}, \frac{1}{4}, \frac{3}{4}, \frac{1}{2}, \frac{1}{4}$. What is the total height of all plants combined?

Three plants at $\frac{1}{4}$: $3 \times \frac{1}{4} = \frac{3}{4}$. Two at $\frac{1}{2}$: $2 \times \frac{1}{2} = 1$. One at $\frac{3}{4}$: $\frac{3}{4}$. Total: $\frac{3}{4} + 1 + \frac{3}{4} = 2\frac{1}{2}$ inches.

Answer: $2\frac{1}{2}$ inches

Practice Problems

Use the data to answer each question.

- Data set A (lengths in inches): $\frac{1}{8}, \frac{1}{4}, \frac{1}{4}, \frac{3}{8}, \frac{1}{2}, \frac{1}{4}, \frac{3}{8}, \frac{1}{8}$.
What is the most common length?

- Using Data Set A, find the total of all the lengths combined.

- Using Data Set A, what is the difference between the longest and shortest lengths?

- Data set B (distances in miles): $\frac{1}{2}, \frac{3}{4}, \frac{1}{2}, \frac{1}{4}, \frac{3}{4}, \frac{3}{4}, \frac{1}{2}$. How many data points are at $\frac{3}{4}$ mile?

- Using Data Set B, find the total distance of all the runs combined.

- Using Data Set B, how much farther is the greatest distance than the least distance?

- If you add one more data point of $\frac{1}{4}$ to Data Set B, what is the new total?

- Data set C (weights in pounds): $\frac{1}{2}, \frac{1}{2}, \frac{1}{4}, \frac{3}{4}, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}, \frac{1}{4}$.
What is the combined weight?

Word Problems

- Eight students measured the rainfall in their rain gauges. The amounts (in inches) were: $\frac{1}{8}, \frac{1}{4}, \frac{1}{4}, \frac{3}{8}, \frac{1}{4}, \frac{1}{8}, \frac{3}{8}, \frac{1}{2}$. Find the total rainfall and the difference between the greatest and least amounts.

- A farmer records the growth (in inches) of 6 seedlings: $\frac{1}{2}, \frac{3}{4}, \frac{1}{2}, \frac{1}{4}, \frac{3}{4}, \frac{1}{2}$. How much did the seedlings grow in total? What is the average growth per seedling?



Answer Keys

1. $\frac{1}{4}$

2. $2\frac{1}{8}$

3. $\frac{3}{8}$

4. 3

5. 4

6. $\frac{1}{2}$

7. $4\frac{1}{4}$

8. $3\frac{3}{4}$

9. $2\frac{1}{8}; \frac{3}{8}$

10. $3\frac{1}{4}; \frac{13}{24}$

Step-by-Step Explanations

1. Start with the main idea. For line plots with fractions, $\frac{1}{4}$ appears three times, more than any other length. Fractions are easier to combine when the pieces are the same size.

2. Keep the work tidy. For line plots with fractions, add all the lengths: $\frac{1}{8} + \frac{1}{4} + \frac{1}{4} + \frac{3}{8} + \frac{1}{2} + \frac{1}{4} + \frac{3}{8} + \frac{1}{8} = 2\frac{1}{8}$. Always simplify at the end so the answer is clean and useful.

3. Look at what the numbers mean. For line plots with fractions, the longest is $\frac{1}{2}$ and shortest is $\frac{1}{8}$; $\frac{1}{2} - \frac{1}{8} = \frac{3}{8}$. For mixed numbers, converting to improper fractions can make the arithmetic calmer.

4. Use the setup first. For line plots with fractions, $\frac{3}{4}$ appears three times. Fractions are easier to combine when the pieces are the same size.

5. Check the size of the answer. For line plots with fractions, add the distances: $\frac{1}{2} + \frac{3}{4} + \frac{1}{2} + \frac{1}{4} + \frac{3}{4} + \frac{3}{4} + \frac{1}{2} = 4$. Always simplify at the end so the answer is clean and useful.

6. Match the operation to the words. For line plots with fractions, greatest is $\frac{3}{4}$ and least is $\frac{1}{4}$; difference is $\frac{1}{2}$. For mixed numbers, converting to improper fractions can make the arithmetic calmer.

7. Write the important values first. For line plots with fractions, adding another $\frac{1}{4}$ to the total 4 gives $4\frac{1}{4}$. Fractions are easier to combine when the pieces are the same size.

8. Follow the pattern carefully. For line plots with fractions, add the weights to get $3\frac{3}{4}$ pounds. Always simplify at the end so the answer is clean and useful.

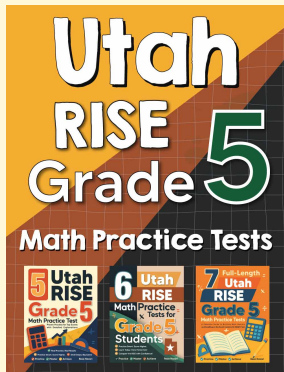
9. Start with the main idea. For line plots with fractions, the rainfall total is $2\frac{1}{8}$ inches and the range is $\frac{1}{2} - \frac{1}{8} = \frac{3}{8}$. For mixed numbers, converting to improper fractions can make the arithmetic calmer.

10. Keep the work tidy. For line plots with fractions, total growth is $3\frac{1}{4} = \frac{13}{4}$ inches; divide by 6 to get $\frac{13}{24}$ inch. Fractions are easier to combine when the pieces are the same size.



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