Mixed Operations with Fractions

Mixed Operations with Fractions: Find, Fix, and Work Backward

Name _____ **Date** _____ **Score** _____ / 8

QUICK REVIEW

Match the operation to what changes: combine, remove, scale, or share. For addition or subtraction, first count equal-size parts. When a story has several actions, keep track of what each result measures.

Worked example

Two equal strips are joined and then trimmed by $\frac{1}{6}$ m in all. The trimmed length is $\frac{1}{2}$ m. How long was each strip?

1. Undo the trim: $\frac{1}{2} + \frac{1}{6} = \frac{4}{6} = \frac{2}{3}$ m.
2. The two strips share 2 thirds equally, so each strip is $\frac{1}{3}$ m.
3. Check: $2 \times \frac{1}{3} - \frac{1}{6} = \frac{1}{2}$ m.
Answer: $\frac{1}{3}$ m per strip.

Practice Problems

Show your thinking.

1. Mia adds $\frac{2}{3}$ L and $\frac{1}{4}$ L and reports $\frac{3}{7}$ L. Explain what is wrong and find the total.

2. A spool loses $\frac{3}{8}$ m and then gains $\frac{1}{6}$ m. It ends with $\frac{5}{6}$ m. Work backward to find the starting length.

3. A student finds $\frac{2}{3}$ of $\frac{3}{4}$ cup by adding and gets $\frac{17}{12}$ cups. Explain which operation to use and find the correct amount.

4. A baker sets aside $\frac{1}{4}$ kg of dough. The rest fills 6 packets with $\frac{1}{8}$ kg each. Recover the amount before setting any aside.

5. Four cups hold $\frac{3}{8}$ L each. Pour them together and remove $\frac{1}{4}$ L once. Lee removes $\frac{1}{4}$ L from each cup instead. Find the correct remainder and how far off Lee is.

6. Split $\frac{1}{4}$ L equally into 4 jars, then add $\frac{1}{4}$ L to one jar only. A student combines both amounts before sharing. Find the chosen jar amount for each method.

7. Three equal strips and one extra $\frac{1}{4}$ m piece make 1 m in all. Work in quarter-meters to find each equal strip length.

8. From $\frac{5}{6}$ L of paint, a helper uses one third of it. The helper says $\frac{5}{18}$ L is used and $\frac{5}{12}$ L is left. Check both claims.

Answer Key

1. $\frac{11}{12}$ L; add equal-size parts.
2. $1\frac{1}{24}$ m.
3. $\frac{1}{2}$ cup; multiply to take a fraction of an amount.
4. 1 kg.
5. $1\frac{1}{4}$ L remains; Lee is $\frac{3}{4}$ L low.
6. Correct: $\frac{5}{16}$ L; student: $\frac{1}{8}$ L.
7. $\frac{1}{4}$ m per strip.
8. Used is correct; $\frac{5}{9}$ L is left.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Thirds and fourths differ in size. Use $\frac{2}{3} = \frac{8}{12}$ and $\frac{1}{4} = \frac{3}{12}$.
2. Add the twelfths: $\frac{8}{12} + \frac{3}{12} = \frac{11}{12}$ L.

Problem 2

1. Undo the gain: $\frac{5}{6} - \frac{1}{6} = \frac{2}{3}$ m.
2. Undo the loss: $\frac{2}{3} + \frac{3}{8} = \frac{16}{24} + \frac{9}{24} = \frac{25}{24}$ m.
3. Check: $\frac{25}{24} - \frac{3}{8} + \frac{1}{6} = \frac{5}{6}$ m.

Problem 3

1. Take part of the $\frac{3}{4}$ cup; do not add another $\frac{2}{3}$ cup.
2. $\frac{2}{3} \times \frac{3}{4} = \frac{6}{12} = \frac{1}{2}$ cup.

Problem 4

1. The packets account for $6 \times \frac{1}{8} = \frac{6}{8} = \frac{3}{4}$ kg.
2. Restore the reserve: $\frac{3}{4} + \frac{1}{4} = 1$ kg.
3. Check: $1 - \frac{1}{4} = \frac{3}{4}$ kg for packing.

Problem 5

1. Pool the cups, then remove once: $4 \times \frac{3}{8} - \frac{1}{4} = \frac{5}{4}$ L.
2. Lee would leave $4 \times (\frac{3}{8} - \frac{1}{4}) = \frac{1}{2}$ L.
3. The difference is $\frac{5}{4} - \frac{1}{2} = \frac{3}{4}$ L.

Problem 6

1. The first share is $\frac{1}{4} \div 4 = \frac{1}{16}$ L.
2. Add to one jar: $\frac{1}{16} + \frac{1}{4} = \frac{5}{16}$ L.
3. Combining first gives $\frac{1}{2}$ L, and $\frac{1}{2} \div 4 = \frac{1}{8}$ L per jar.

Problem 7

1. A meter has 4 quarters. Remove the extra quarter: $4 - 1 = 3$ quarters.
2. Share among the strips: $3 \div 3 = 1$ quarter per strip.
3. Check: $3 \times \frac{1}{4} + \frac{1}{4} = 1$ m.

Problem 8

1. Used: $\frac{1}{3} \times \frac{5}{6} = \frac{5}{18}$ L.
2. Left: $\frac{15}{18} - \frac{5}{18} = \frac{10}{18} = \frac{5}{9}$ L.
3. The two parts add back to $\frac{5}{18} + \frac{10}{18} = \frac{5}{6}$ L.

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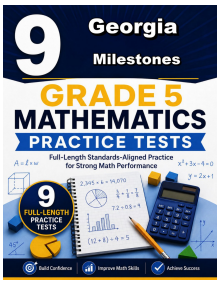

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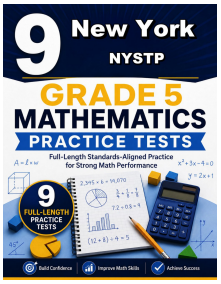

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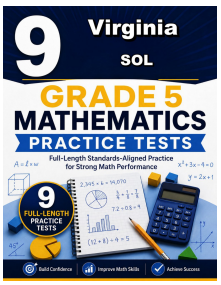

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