Mixed Operations with Fractions

Mixed Operations with Fractions: Apply, Compare, and Design

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

A cook has $\frac{5}{6}$ L of soup, serves $\frac{1}{3}$ L, then splits the rest equally into 2 containers. Find the amount per container.

1. After serving, $\frac{5}{6} - \frac{1}{3} = \frac{3}{6} = \frac{1}{2}$ L remains.
2. Share the remainder: $\frac{1}{2} \div 2 = \frac{1}{4}$ L per container.
Answer: $\frac{1}{4}$ L per container.

Practice Problems

Show your thinking.

1. Each of 3 kits needs $\frac{3}{4}$ m of ribbon. Keep another $\frac{1}{3}$ m in reserve. Can $2\frac{1}{2}$ m cover both needs? Find any shortfall.

2. Plan A joins two $\frac{4}{5}$ m boards and trims $\frac{1}{5}$ m from the total. Plan B joins three $\frac{1}{2}$ m boards with no trim. Which finished length is longer and by how much?

3. A tank has 5 L. Use $\frac{2}{5}$ of it on plants and keep 1 L for washing. How many $\frac{1}{4}$ L bottles can the rest fill?

4. One batch needs $\frac{1}{2}$ cup of flour and $\frac{1}{6}$ cup of oil. You have 3 cups of flour and $\frac{2}{3}$ cup of oil. Find the most whole batches, the ingredient that limits them, and the flour left.

5. Share $\frac{1}{2}$ kg of grain equally among 4 trays. Add $\frac{1}{6}$ kg to each of two trays. How much is in the two larger trays together? In all four?

6. Pack 4 kg of rice into $\frac{1}{4}$ kg bags. Give away half the bags on Monday and 3 more on Tuesday. How many bags and kilograms remain?

7. You have $2\frac{1}{4}$ cups and must reserve $\frac{1}{2}$ cup. Choose the largest size, $\frac{1}{4}$, $\frac{1}{3}$, or $\frac{1}{2}$ cup, for 4 equal servings. How much is left beyond the reserve?

8. Paint half of a 3 m strip blue. Then paint two thirds of the unpainted part green. Find the blue, green, and unpainted lengths.

Answer Key

1. No; $\frac{1}{12}$ m more is needed.
2. B; $\frac{1}{10}$ m longer.
3. 8 bottles.
4. 4 batches; oil limits them; 1 cup flour left.
5. $\frac{7}{12}$ kg in the two larger trays; $\frac{5}{6}$ kg in all.
6. 5 bags; $1\frac{1}{4}$ kg.
7. $\frac{1}{3}$ cup per serving; $\frac{5}{12}$ cup extra.
8. Blue: $1\frac{1}{2}$ m; green: 1 m; unpainted: $\frac{1}{2}$ m.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The kits need $3 \times \frac{3}{4} = \frac{9}{4}$ m.
2. With reserve, $\frac{9}{4} + \frac{1}{3} = \frac{31}{12}$ m is needed.
3. Supply is $\frac{30}{12}$ m, so the shortfall is $\frac{1}{12}$ m.

Problem 2

1. A finishes at $2 \times \frac{4}{5} - \frac{1}{5} = \frac{7}{5}$ m.
2. B finishes at $3 \times \frac{1}{2} = \frac{3}{2}$ m.
3. B is longer by $\frac{15}{10} - \frac{14}{10} = \frac{1}{10}$ m.

Problem 3

1. The plants use $\frac{2}{5} \times 5 = 2$ L.
2. After the wash reserve, $5 - 2 - 1 = 2$ L can be bottled.
3. $2 \div \frac{1}{4} = 8$ bottles.

Problem 4

1. Flour allows $3 \div \frac{1}{2} = 6$ batches.
2. Oil gives $\frac{2}{3} = \frac{4}{6}$ cup, or 4 portions, so it sets the limit.
3. Four batches use $4 \times \frac{1}{2} = 2$ cups flour, leaving $3 - 2 = 1$ cup.

Problem 5

1. Each original share is $\frac{1}{2} \div 4 = \frac{1}{8}$ kg.
2. Two larger trays hold $2 \times (\frac{1}{8} + \frac{1}{6}) = 2 \times \frac{7}{24} = \frac{7}{12}$ kg.
3. All trays hold $\frac{1}{2} + 2 \times \frac{1}{6} = \frac{5}{6}$ kg.

Problem 6

1. Pack $4 \div \frac{1}{4} = 16$ bags.
2. Monday uses $\frac{1}{2} \times 16 = 8$ bags; $16 - 8 - 3 = 5$ remain.
3. The remaining mass is $5 \times \frac{1}{4} = 1\frac{1}{4}$ kg.

Problem 7

1. Available after reserve: $\frac{9}{4} - \frac{1}{2} = \frac{7}{4}$ cups.
2. Four halves need 2 cups, too much. Four thirds need $\frac{4}{3}$ cups, which fits.
3. Extra: $\frac{7}{4} - \frac{4}{3} = \frac{21}{12} - \frac{16}{12} = \frac{5}{12}$ cup.

Problem 8

1. Blue covers $\frac{1}{2} \times 3 = \frac{3}{2}$ m, leaving $\frac{3}{2}$ m.
2. Green covers $\frac{2}{3} \times \frac{3}{2} = 1$ m.
3. Unpainted: $\frac{3}{2} - 1 = \frac{1}{2}$ m.

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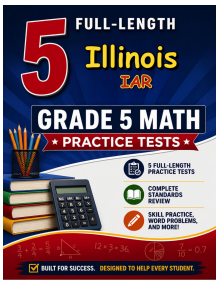

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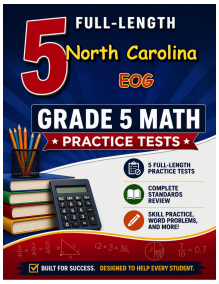

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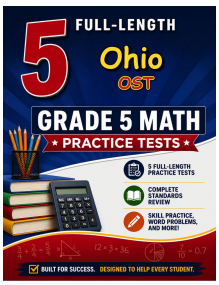

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