Many recipes include ingredients that are measured in terms of fractions and mixed numbers. For example, a cake recipe may call for 2 ½ cups of flour, ½ teaspoons of baking powder, etc. Sometimes you may want to change a recipe and will have to do some basic calculations with the fractions and mixed numbers.

Adding & Subtracting Fractions – Same Denominators (Like Fraction Parts)

The following example illustrates a procedure for adding or subtracting fractions with the same denominator. Fractions with the same denominators are sometimes referred to as **like fractions**.

Example 1:
You are preparing a meal to celebrate your mother's birthday. You use her favorite recipes to make a zucchini bread for dinner and a chocolate birthday cake. The recipes call for ¼ teaspoon of baking powder for the bread and ¾ teaspoon of baking powder for the cake. How much baking powder do you need?

1. For each of the following, perform the indicated operation. Convert improper fractions to mixed numbers. Write the result in lowest terms.
   a. $\frac{1}{3}+\frac{1}{3}$
   b. $\frac{3}{5}+\frac{4}{5}$
   c. $\frac{3}{10}+\frac{9}{10}$
   d. $\frac{3}{8}+\frac{5}{8}$
   e. $\frac{6}{7}+\frac{4}{7}$
   f. $\frac{7}{8}-\frac{3}{8}$
   g. $\frac{3}{4}-\frac{1}{4}$
   h. $\frac{13}{18}-\frac{5}{18}$

2. A general rule for adding two fractions with the same denominator is:

$$\frac{a}{c}+\frac{b}{c}=\text{———}$$

3. A general rule for subtracting two fractions with the same denominator is:

$$\frac{a}{c}-\frac{b}{c}=\text{———}$$

Adding and Subtracting Mixed Numbers – Same Denominators (Like Fraction Parts)

Example 2:
A Scandinavian rye bread recipe calls for 3¼ cups of white flour and 2¼ cups of rye flour. You have a mixer that can measure up to 8 cups which you dump the 3¼ cups of white flour into. You add the rye flour on top of the white flour. At what measurement should you stop?

4. For each of the following, perform the indicated operation. Write the fractional part of the mixed number in lowest terms and it shouldn't be an improper fraction.

   a. $10\frac{3}{7}+15\frac{2}{7}$

   b. $1\frac{1}{6}+9\frac{5}{6}$

   c. $12\frac{1}{8}+48\frac{5}{8}$

   d. $1\frac{13}{16}+4\frac{5}{16}$

Example 3:
Your bread machine holds a maximum of 5¾ cups of flour. You want to use a favorite recipe that calls for 7¼ cups of flour. By how much must your recipe be reduced so you will be able to use the bread machine?

5. When subtraction 4¾, you are really subtracting 4 and subtracting ¾. Perform each of the following subtractions. Write the fractional part of the mixed number in lowest terms.

   a. $13\frac{5}{7}-9\frac{4}{7}$

   b. $9\frac{5}{6}-8\frac{1}{6}$

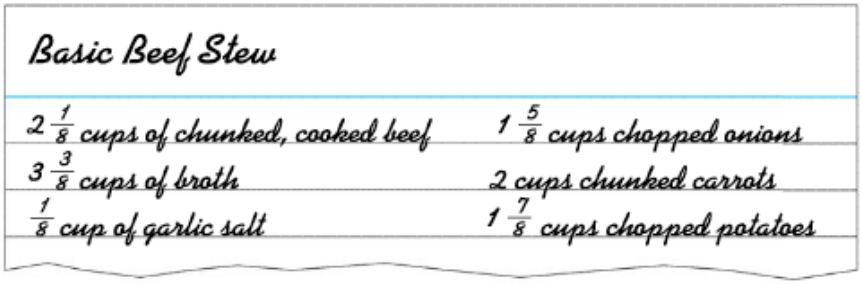
   c. $45\frac{9}{13}-17\frac{5}{13}$

   d. $34\frac{9}{13}-15\frac{11}{13}$

   e. $4\frac{2}{7}-2\frac{4}{7}$

6. You need 5⅓ tablespoons of butter to bake a small apple tart and have one stick of butter which is 8 tablespoons. How much butter will you have left after you use it to make the tart?

7. The purpose of baseboard molding in a room is to finish the area where the wall meets the floor. A carpenter got a good deal on the molding she wanted because she was willing to buy the last 112⅞ feet the store had. If she used 96⅜ feet to finish two rooms, how much did she have left over?
8. Adding and subtracting like fractions and mixed numbers are used in a variety of situations. For example, consider the ingredient amounts in the following beef stew recipe.



a. You need to mix all of these ingredients together in a large mixing bowl. To determine what size mixing bowl to use, add all ingredient amounts listed in the recipe. What is the total number of cups of ingredients in the stew?

b. Your mixing bowls come in 10-cup, 15-cup, and 20-cup sizes. Which mixing bowls can you use?

c. How much space do you have for mixing the ingredients in the possible bowls?

d. A friend who does not like potatoes is coming to dinner. So you decide to take the potatoes out of the recipe. Determine the new total number of cups of ingredients in the potato-free version of the stew?

Exercises:

Perform the indicated operation. Write all results in lowest terms.

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

2. $\frac{4}{5}-\frac{1}{5}$

3. $\frac{5}{12}+\frac{1}{12}$

4. $\frac{5}{8}-\frac{3}{8}$

5. $\frac{2}{3}+\frac{2}{3}$

6. $\frac{9}{4}-\frac{3}{4}$

7. $\frac{1}{4}+\frac{5}{4}$

8. $\frac{20}{12}-\frac{4}{12}$

9. $3\frac{2}{5}+5\frac{1}{5}$

10. $4\frac{5}{7}-3\frac{2}{7}$

11. $3\frac{1}{4}+2\frac{1}{4}$

12. $8\frac{2}{5}-5\frac{4}{5}$

13. $7\frac{2}{9}-2\frac{4}{9}$

13. $6\frac{11}{17}-8\frac{15}{17}$

14. $8\frac{4}{11} - \frac{7}{11}$

15. $14\frac{7}{8} + 8\frac{3}{8}$

16. You take home $400 a month from your part-time job as a cashier. Each month you budget $120 for car expense, $160 for food and the rest for entertainment.
    a. What fraction of your take-home pay is budgeted for car expenses? (reduce to lowest terms)

    b. What fraction of your take-home pay is budgeted for food? (reduce to lowest terms)

    c. What fraction of your take-home pay is budgeted for entertainment? (reduce to lowest terms)

17. Your bedroom measures 12⅛ feet by 10⅜ feet. You want to put a wallpaper border around the perimeter of the room. How much wallpaper do you need? Remember, the perimeter of a rectangle is the sum of the lengths of the four sides of the rectangle.