

## Algebra 2

### Lesson 2 Fractions

What is a fraction?

→ A fraction represents a part of a whole. Think about it like division.

Here's an example of a fraction we always see in our daily life:

You and a friend share one cookie, how much cookie do you each get if you share evenly?

Each friend gets  $\frac{1}{2}$  of a cookie.

Remember that fractions represent division,  $\frac{1}{2}$  of a cookie means 1 cookie divided into 2 parts. Another example is  $\frac{4}{7}$  you have four of something and they are being divided into seven parts.

What are the parts of a fraction?

- The part above the line or the amount of something you have is the *numerator*. In the cookie example, the numerator would be 1; 1 is on the top and you have 1 cookie.
- The part below the line or the number of parts you are dividing something into is the *denominator*. In the cookie example, the denominator is 2; 2 is on the bottom and you are dividing the cookie into 2 parts.

How do we add fractions?

- Before we add fractions we must find a *common denominator*. You cannot add fractions unless you have the same denominator.

How do we find a common denominator?

- A common denominator is a shared denominator between two fractions.

Ex: What is the common denominator of  $\frac{2}{3}$  and  $\frac{1}{4}$  ?

- Multiply  $3 \times 4 = 12$ , to get a common denominator of 12

Back to adding fractions...

If the denominators of a fraction are the same we can add them. Remember to only add the numerators.

Ex: Add  $\frac{2}{3}$  and  $\frac{1}{4}$

→ In the previous example we discovered that the common denominator of  $\frac{2}{3}$  and  $\frac{1}{4}$  was 12. Take the fraction  $\frac{2}{3}$  we need to convert this to a fraction with a denominator 12. We can do this by multiplying the entire fraction by  $\frac{4}{4}$ . Remember that  $\frac{4}{4}$  is 1. Thus,  $\frac{2}{3} \times \frac{4}{4} = \frac{8}{12}$ . Now, let's repeat this process with  $\frac{1}{4}$  this time multiplying by  $\frac{3}{3}$ , this gives us  $\frac{1}{4} \times \frac{3}{3} = \frac{3}{12}$ . We now have two fractions with the same denominator which means we can add them!

$$\frac{8}{12} + \frac{3}{12} = \frac{11}{12}.$$

How do we subtract fractions?

→ Subtracting fractions is just like adding fractions. Fractions must have a common denominator before we subtract them.

Ex: Subtract  $\frac{1}{7} - \frac{1}{9}$

→ Our common denominator would be  $7 \times 9 = 63$ . Let's convert both of our fractions to get to the common denominator of 63. We start with  $\frac{1}{7}$   
 $\frac{1}{7} \times \frac{9}{9} = \frac{9}{63}$  next let's do  $\frac{1}{9}$ ,  $\frac{1}{9} \times \frac{7}{7} = \frac{7}{63}$ . Since, we have to fraction with common denominators we can subtract them.  $\frac{9}{63} - \frac{7}{63} = \frac{2}{63}$

**Guided Practice:**

1. Marry reads  $\frac{1}{9}$  of a book on Monday,  $\frac{2}{7}$  on Tuesday, and  $\frac{1}{4}$  on Wednesday, how much must she read on Thursday to finish the book?
2. Mrs. Allen spends  $\frac{3}{5}$  of her money at the grocery store. She then has \$8.00 left. With the total number of dollars did Mrs. Allen start?
3. Lucy has really long hair. One day she decides to cut off  $\frac{1}{4}$  of a meter a couple of days later cuts off an additional  $\frac{2}{3}$  of a meter. How much hair has she cut off?
4. Melody ran  $\frac{4}{5}$  miles in the morning and  $\frac{1}{2}$  miles in the evening, how much more did she run in the morning than the evening.
5. Judy's sister gave her  $\frac{3}{4}$  of a cookie. Her brother gave her  $\frac{1}{7}$  of a cookie. How much cookie does Judy have now?

**Homework:**

1. A recipe requires  $\frac{1}{2}$  teaspoon cayenne pepper,  $\frac{3}{4}$  teaspoon black pepper, and  $\frac{1}{4}$  teaspoon red pepper. How much pepper does this recipe need?
2. You give  $\frac{1}{3}$  of a pan of brownies to Susan and  $\frac{1}{6}$  of the pan of brownies to Patrick. How much of the pan of brownies did you give away?
3. A school wants to make a new playground by cleaning up an abandoned lot that is shaped like a rectangle. They give the job of planning the playground to a group of students. The students decide to use  $\frac{1}{4}$  of the playground for a basketball court and  $\frac{3}{8}$  of the playground for a soccer field. How much is left for the swings and play equipment?
4. Jessica bought  $\frac{8}{9}$  of a pound of chocolates and ate  $\frac{1}{3}$  of a pound. How much chocolate was left?
5. Which apple weighs more, one that weighs  $\frac{2}{3}$  of a pound or one that weighs  $\frac{5}{6}$  of a pound?