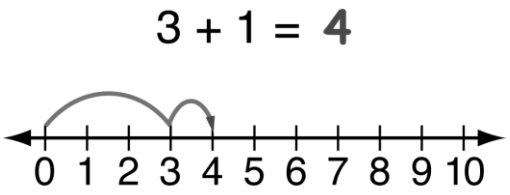
Name:_____ **Adding and subtracting fractions**

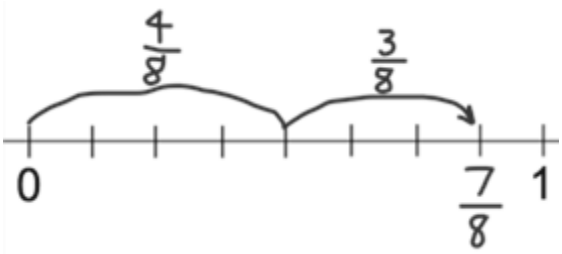
Adding fractions on the number line:

You know how to add whole numbers using a number line. For example, if you want to add 3 and 1, you move 3 units to the right of zero, and then you move another 1 unit. This lands you at the number 4, *which is 4 units from zero*.



You add fractional units on the number line in the same way.

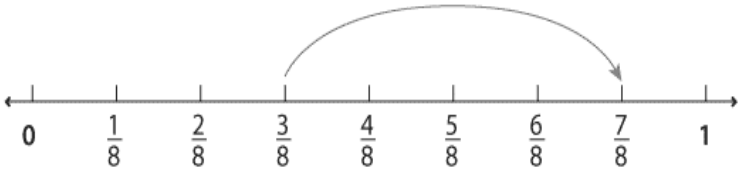
Here is a section of the number line. The segment of the line between 0 and 1 is **one unit** in length. It has been divided into 8 equal pieces. Each piece is **1/8 unit** in length.



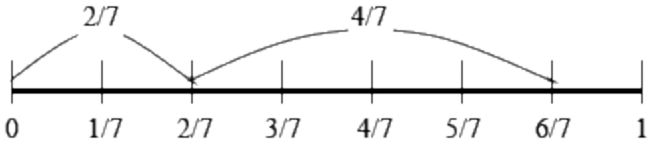
Let's say I want to add **4/8** and **3/8**. I first move **4/8** unit to the right of zero, and then I move another **3/8** unit. This lands me on the fractional number **7/8**, *which is **7/8 unit** from zero*.

Adding fractions is commutative.

4/8 + 3/8 = 3/8 + 4/8.

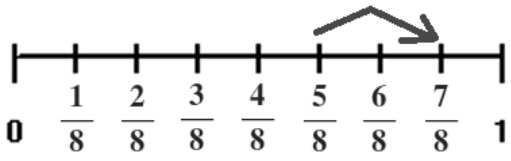


If we start at 3/8 and move 4/8 units farther along the number line, we still end up 7/8 unit from zero at the fractional number 7/8.



The figure on the left show how we would add 2/7 and 4/7 on the number line. Now, we would divide the **unit distance**—the distance between 0 and 1—into **7** equal pieces. This time each piece is **1/7 unit** in length. To add 2/7 + 4/7, we move 2/7 unit along the number line from zero and then move another 4/7 unit. This lands us on the fractional number **6/7**, which is **6/7 unit** from zero. So, 2/7 + 4/7 = 6/7. (We could also have started at the point 2/7 and moved 4/7 unit farther along the number line, still ending up at the point 6/7.)

This unit segment shows adding 2/8 to 5/8 by starting at 5/8 and moving another 2/8 unit to the right. 5/8 + 2/8 = 7/8.

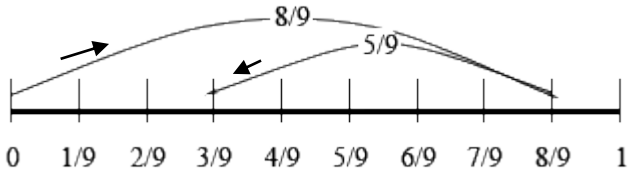


Name:_____ **Adding and subtracting fractions**

Subtracting fractions on the number line:

You subtract fractions on the number line in the same way you subtract whole numbers.

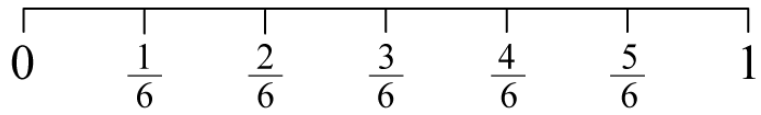
Let's say we want to subtract 5/9 from 8/9.



8/9 – 5/9 = 3/9

We first divide the unit distance into **9** equal parts. Each part is **1/9** unit in length. We go to the point **8/9** on the number line by moving a distance of **8/9 unit** to the right of zero. Then we move back **5/9 unit** to the left (toward zero). [Or, we can just start at the point **8/9** and move to the left **5/9 unit**.] We end up at the point **3/9**, which is 3/8 unit from zero.

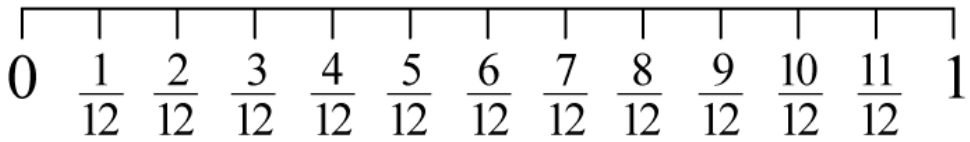
1. *Using the number line below, show how to add 2/6 + 3/6*.



2/6 + 3/6 = _____

2. *Use the number line below to subtract 7/12 – 5/12*.

7/12 – 5/12 = _____



Another way to subtract two numbers on the number line is to see how far apart they are (the 'difference' between them). In this case, 7/12 *and* 5/12 are 2/12 unit apart on the number line. So, the 'difference' between them is 2/12 unit.