Name: _____ Subtracting Mixed Numbers

You can subtract *like* fractions. And you can subtract a fraction from a whole number. Now, let's subtract mixed numbers (with *like* fractional parts).

You can subtract mixed numbers in either of two ways.

One way is to change the mixed numbers to improper fractions and then subtract them just as you would proper fractions.

2 1/4 – 1 ¾ = 9/4 – 7/4 = 2/4

The other way is to separate the mixed numbers into whole and fractional parts and subtract the parts separately.

3 6/7 – 1 4/7 = (3-1) + (6/7 – 4/7) = 2 + 2/7 = 2 $^{2}/_{7}$

This is fine so long as the fractional part of the number you're subtracting is less than the fractional part of the number you're subtracting from.

But what if it isn't. Suppose you want to subtract 3 2/6 – 1 5/6. You can't simply subtract 2/6 – 5/6. So what do you do?

Why, you can change both mixed numbers to improper fractions and subtract using the first method.

3 2/6 – 1 5/6 = 20/6 – 11/6 = 9/6 = 1 3/6

Notice that we tidied up our answer 9/6 by changing it into the mixed number 1 3/6.

But there's another way to do this as well.

Let's go back to original problem:

3 2/6 – 1 5/6

We can take one of the 3 wholes and change it to 6/6.

We then add the 6/6 to the 2/6 and subtract the 5/6 from the sum.

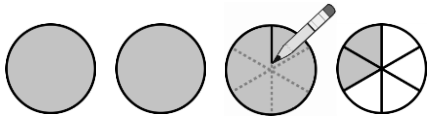
Here's how it works:

3 2/6 – 1 5/6 = (2 + 6/6 + 2/6) – 1 5/6

= 2 8/6 – 1 5/6

= (2 – 1) + (8/6 – 5/6) = 1 3/6

Subtract: **3 2/6 – 1 5/6**



At first, we have three whole circles and 2/6 more. Then we divide 1 of the whole circles into sixths. We end up with 2 whole circles and 8 sixths.

We say that 3 2/6 has been *renamed* (or *regrouped*) as 2 8/6. Now we can subtract 1 5/6 easily.

2 8/6 – 1 5/6 = 1 3/6

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You can also subtract mixed numbers in columns.

Here's our problem 3 2/6 – 1 5/6 written in a column.

You can't subtract 5/6 from 2/6. What do you do?—

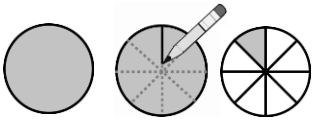
Take one of the 3 wholes (from 3 2/6) and change it to 6/6.

That leaves 2 wholes. Now, add the 6/6 to the 2/6.

$$\begin{array}{r} \mathbf{2\ 8/6} \\ \cancel{3}\ \cancel{\frac{2}{6}} \\ -\ 1\ \frac{5}{6} \\ \hline 1\ \frac{3}{6} \end{array}$$

This gives 2 8/6. (Notice that all we've done is to *rename* 3 2/6 as 2 8/6. The two mixed numbers are equivalent.) Finally, you subtract: 2 8/6 – 1 4/6 = 1 3/6.

Let's do another. How about 2 1/8 – 1 5/8?



We can't subtract 5/8 from 1/8.

So, we must *rename* 2 1/8.

At first, we have 2 wholes and 1/8 more.

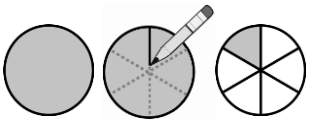
We divide 1 of the wholes into eighths.

$$\begin{array}{r} \mathbf{1\ 9/8} \\ 2\ \cancel{\frac{1}{8}} \\ -\ 1\ \frac{5}{8} \\ \hline \frac{4}{8} \end{array}$$

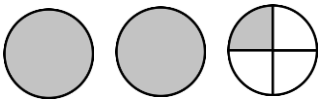
We end up with 1 whole and 9/8. Now we subtract fractions from fractions and wholes from wholes. This leaves us with 4/8 as our answer.

2 1/8 – 1 5/8 = 1 9/8 – 1 5/8 = (1 – 1) + (9/8 – 5/8) = 0 + 4/8 = 4/8

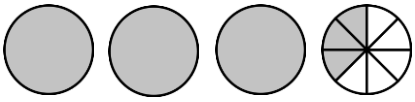
<u>Your Turn</u>:



2 1/6 – 5/6 =



2 ¼ - 1 ¾ =



3 3/8 – 2 7/8 =