Study Guide: Adding & Subtracting Mixed Numbers

Adding and subtracting mixed numbers is very similar to how we add and subtract regular fractions, but now we have to deal with a whole number part. To approach this kind of question, it's best to remember that a mixed number is just the whole number *plus* the mixed part.

$$1\frac{1}{2} = 1 + \frac{1}{2}$$

If that's true, then think about how we can break apart these questions that involve adding together different mixed numbers. Check out this example:

$$1\frac{1}{5} + 2\frac{2}{5} = 1 + \frac{1}{5} + 2 + \frac{2}{5}$$

Look at that! Why don't we try adding together the *easy* stuff: Add the whole numbers together, then add the fraction parts together.

$$\ldots \; = 1 + 2 + \frac{1}{5} + \frac{2}{5} = 3 + \frac{3}{5} = 3\frac{3}{5}$$

The same thing works for subtracting! Check it out:

$$3\frac{2}{3} - 1\frac{1}{3} = (3 - 1) + \left(\frac{2}{3} - \frac{1}{3}\right) = 2\frac{1}{3}$$

There is one special case with subtraction we have to be careful with: what if one of the fractions is too big to subtract from the other? Let's explore this case:

$$4\frac{3}{8} - 1\frac{5}{8} = 4 - 1\& \left(\frac{3}{8} - \frac{5}{8}\right) = 3 + \left(\frac{3}{8} - \frac{5}{8}\right)$$

If this happens, we need to "borrow one whole" from the whole number part. Watch how we transfer one from the 3, and give it to the fraction $\frac{3}{8}$. First, remove the parenthesis (which are only there to separate the fraction parts).v

$$3 + \left(\frac{3}{8} - \frac{5}{8}\right) \; = \; 2 + 1 + \frac{3}{8} - \frac{5}{8} \; = \; 2 + \frac{8}{8} + \frac{3}{8} - \frac{5}{8} \; = \; 2 + \left(\frac{11}{8} - \frac{5}{8}\right)$$

Notice that we transferred the value of one from the 3, and turned it into an equivalent whole fraction, which is $\frac{8}{8}$. We added this with the too-small fraction so we can finish our problem.

$$2 + \frac{11}{8} - \frac{5}{8} \; = \; 2 + \frac{6}{8} \; = \; 2\frac{6}{8} \; = \; 2\frac{3}{4} \; \blacksquare$$

1. $1\frac{1}{2}+1\frac{1}{2}$

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

3. $3\frac{3}{4}-2\frac{1}{4}$

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

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

6. $4\frac{3}{4}+3\frac{1}{2}$

7. $3\frac{1}{2}-2\frac{1}{4}$

8. $4\frac{1}{3}-2\frac{1}{2}$

9. $10\frac{7}{8}+12\frac{3}{8}$

10. $20\frac{1}{6}-18\frac{1}{4}$

11. $105\frac{1}{5}+205\frac{1}{4}$

12. $23\frac{1}{5}-5\frac{3}{8}$

13. $15\frac{9}{11} + 10\frac{3}{5}$

14. $49\frac{2}{5} - 5\frac{3}{4}$

Word Problems

15. Marcine is baking a cheesecake and used $1\frac{1}{3}$ cups of strawberries and $\frac{2}{5}$ cups of blueberries to make a glaze. How much total fruit did she use to make the cake?

16. Patrick went to the supermarket and had a budget of $10 to buy some items. He spent $\$3\frac{1}{4}$ on cleaning supplies and $\$2\frac{2}{5}$ on drinks. How much money was Patrick left with after paying?

17. A radio station has a 3-hour schedule for music and advertisements. For the first hour, they play $2\frac{1}{2}$ minutes of ads. For the second hour they play $3\frac{1}{4}$ minutes of ads. The final hour they play 2 minutes of ads...
    a. How many total minutes of ads do they play in three hours?

    b. What is the difference in ad minutes between the first and second hour?