Adding and Subtracting Fractions

Review

- What is a numerator?

- What is a denominator?

- What does a normal fraction look like?

- What does a improper fraction look like?

- What does a mixed number look like?

Similar Fractions

When fractions have the same denominator they are *similar fractions.*

You can add or subtract fractions when you have *similar fractions.*

$$\frac{4}{5} \leftarrow \qquad \frac{7}{5} \leftarrow \qquad \frac{6}{5} \leftarrow \qquad \frac{3}{5} \leftarrow \qquad \frac{2}{5} \leftarrow \qquad \frac{5}{5} \leftarrow$$

These are all *similar fractions.*

Adding Similar Fractions

Steps:

1. Make sure that you have similar fractions.
2. Add the numerators.
3. Write the sum over the denominator.
4. Write the answer in simplest form.

$$\frac{1}{6} + \frac{4}{6} = \frac{5}{6}$$

The answer is:

$\frac{5}{6}$

Subtracting Similar Fractions

Steps:

1. Make sure that you have similar fractions.
2. Subtract the numerators.
3. Write the difference over the denominator.
4. Write the answer in simplest form.

$$\frac{7}{8} - \frac{3}{8} = \frac{4}{8}$$

The answer is: $\frac{1}{2}$

Exercise #1

Add or subtract, simplify, use mixed numbers

1. $1/5 + 2/5 =$ $3/5$ 8. $4/5 - 3/5 =$ $1/5$ 15. $12/4 - 3/4 =$ $2\,1/4$

2. $2/3 - 1/3 =$ $1/3$ 9. $7/8 + 3/8 =$ $1\,2/8$ 16. $3/6 + 9/6 =$ 2

3. $3/4 + 2/4 =$ $1\,1/4$ 10. $2/6 + 3/6 =$ $5/6$ 17. $4/13 - 2/13 =$ $2/13$

4. $5/7 + 3/7 =$ $1\,2/7$ 11. $5/10 - 3/10 =$ $1/5$ 18. $7/9 - 1/9 =$ $8/9$

5. $3/2 - 1/2 =$ 1 12. $6/7 + 4/7 =$ $1\,3/7$ 19. $8/16 - 4/16 =$ $1/4$

6. $3/9 + 5/9 =$ $8/9$ 13. $9/12 + 3/12 =$ 1 20. $2/3 + 5/3 =$ $2\,1/3$

7. $2/8 - 2/8 =$ 0 14. $2/7 - 1/7 =$ $1/7$

Dissimilar Fractions

Dissimilar fractions have different denominators.

Adding or subtracting with dissimilar fractions isn't that different from adding or subtracting similar fractions. You just have to find what their denominators have in common.

$$\frac{2}{3} \leftarrow \qquad \frac{3}{4} \leftarrow \qquad \frac{5}{6} \leftarrow \qquad \frac{5}{8} \leftarrow$$

Changing Dissimilar to Similar

Steps:
1. Find a common multiple that will go into both denominators.
2. Multiply the numerator and denominator by the same number so the denominator is the same as the common multiple.

WHAT EVER YOU DO TO THE BOTTOM YOU HAVE TO DO TO THE TOP!

$$\frac{2}{3 \times 2} = \frac{4}{}$$

3, 6, 9, 12, 15, 18

Now you're ready to use these fractions for addition and subtraction!

$$\frac{5}{6 \times 6} = \frac{5}{}$$

6, 11, 18, 24, 30, 36

Exercise #2

Add fractions, put them in simplest form

1. $\frac{1}{2} + \frac{1}{3} =$ $\frac{5}{6}$

2. $\frac{1}{3} + \frac{1}{5} =$ $\frac{8}{15}$

3. $\frac{5}{6} + \frac{1}{3} =$ $1\frac{1}{6}$

4. $\frac{1}{8} + \frac{3}{4} =$ $\frac{7}{8}$

5. $\frac{3}{3} + \frac{5}{6} =$ $1\frac{5}{6}$

6. $\frac{3}{4} + \frac{3}{20} =$ $\frac{9}{10}$

7. $\frac{6}{7} + \frac{3}{4} =$ $1\frac{17}{28}$

8. $\frac{1}{9} + \frac{2}{3} =$ $\frac{7}{9}$

9. $\frac{3}{6} + \frac{2}{9} =$ $\frac{13}{18}$

10. $\frac{1}{6} + \frac{5}{12} =$ $\frac{7}{12}$

Exercise #3 Subtract fractions, put them in simplest form

1. $\frac{1}{2} - \frac{2}{5} =$ $\frac{1}{10}$

2. $\frac{1}{4} - \frac{1}{6} =$ $\frac{1}{12}$

3. $\frac{7}{8} - \frac{2}{3} =$ $\frac{5}{24}$

4. $\frac{4}{5} - \frac{3}{10} =$ $\frac{1}{2}$

5. $\frac{8}{9} - \frac{1}{3} =$ $\frac{5}{9}$

6. $\frac{3}{5} - \frac{1}{3} =$ $\frac{4}{15}$

7. $\frac{1}{3} - \frac{1}{6} =$ $\frac{1}{6}$

8. $\frac{9}{10} - \frac{2}{5} =$ $\frac{1}{2}$

9. $\frac{2}{3} - \frac{1}{2} =$ $\frac{1}{6}$

10. $\frac{4}{5} - \frac{1}{3} =$ $\frac{7}{15}$

Improper Fractions

Improper fractions are easy!

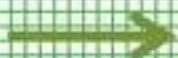Just treat them as if they're normal fractions.

That's it!

Unlike Improper Fractions

$$5/2 \longrightarrow 15/6$$

$$4/3 \longrightarrow \quad - \quad 8/6$$

$$7/6 \text{ or } 1\ ^1/_6$$

Mixed Numbers

There are two ways to change mixed numbers so you can add or subtract.

- Change the mixed number into an improper fraction.

- Change just the fraction and leave the whole number alone.

Mixed Numbers

Steps:
1. Add the fractions together.
2. Add the whole numbers.

The answer is :

$3\,^4/_5$

$$1\,^1/_5$$
$$+\ 2\,^3/_5$$
$$\overline{\ 3\,^4/_5}$$

Dissimilar Mixed Numbers

Steps:
1. Change the dissimilar fractions to similar fractions.
2. Add the fractions.
3. Add the whole numbers.
4. If the fraction is improper, change it to mixed and add the whole numbers.

$$1\frac{1}{2} \; + \; 2\frac{5}{6}$$

The answer
is:

$$4\frac{1}{3} \qquad 3\frac{3}{8} \qquad 4\frac{2}{6}\frac{6}{6}$$

Exercise #4 Add or subtract, write in simplest form

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

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

3. $1 \frac{7}{8} - 1 \frac{6}{8} = \frac{1}{8}$

4. $3 \frac{4}{7} + 2 \frac{3}{7} = 6$

5. $4 \frac{8}{9} - 2 \frac{1}{9} = 2 \frac{7}{9}$

6. $2 \frac{2}{5} + 1 \frac{1}{10} = 3 \frac{1}{2}$

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

8. $5 \frac{2}{3} + 3 \frac{1}{2} = 9 \frac{1}{6}$

9. $3 \frac{5}{6} - 1 \frac{3}{5} = 2 \frac{7}{30}$

10. $6 \frac{1}{4} - 3 \frac{2}{3} = 10$