Lesson 30

Course 2-Teacher Notes

Objective: TSW rename fractions so they have common denominators. TSW compare fractions with different denominators. TSW add and subtract fraction with different denominators.

<u>Common Denominators:</u> When fractions have the same denominator.

$\frac{3}{8}$ $\frac{6}{8}$ *common denominator?* $\frac{3}{8}$ $\frac{3}{4}$ *common denominaors?*

Remember: We can rename a fraction by multiplying it by a fraction equal to 1.

Let's rename $\frac{3}{4}$ so that it has a denominator of 8. What fraction can we multiply it by to get a denominator of 8 that is equal to 1? $\frac{2}{2}$

$\frac{3}{4}x\frac{2}{2} = \frac{6}{8}$

**Remember- to find the common denominator when you have two or more fractions, you need to find the LCM.

Example 1.

Rename $\frac{2}{3} and \frac{1}{4}$ so that they have a common denominator.

Question: What is the LCM? 12

$\frac{2}{3}x\frac{4}{4} = \frac{8}{12}$ *and* $\frac{1}{4}x\frac{3}{3} = \frac{3}{12}$ *answer :* $\frac{8}{12}$ *and* $\frac{3}{12}$

Example 2.

Write these fractions with common denominators and then compare the fractions.

$$\frac{5}{6} \bigcirc \frac{7}{9}$$

What is the LCM? 18

$\frac{5}{6}x\frac{3}{3} = \frac{15}{18}$ *and* $\frac{7}{9}x\frac{2}{2} = \frac{14}{18}$

$$\frac{15}{18} \bigcirc \frac{14}{18} \quad \text{renamed}$$

$$\frac{15}{18} > \frac{14}{18} \quad \text{compared}$$

Example 3.

Arrange the following fractions in order from least to greatest. (Rewrite these fractions with common denominators)

$\frac{2}{3}, \frac{5}{6}, \frac{7}{12}$

What is the LCM? 12

$\frac{2}{3} x \frac{4}{4} = \frac{8}{12} \quad and \frac{5}{6} x \frac{2}{2} = \frac{10}{12} \quad and \frac{7}{12} x \frac{1}{1} = \frac{7}{12}$

Answer:

$\frac{7}{12}, \frac{2}{3}, \frac{5}{6}$

ADDING AND SUBTRACTING FRACTIONS WITH DIFFERENT DENOMINATORS

To add or subtract fractions that do not have common denominators:

1. Find the LCM of all fractions
2. Rewrite each fraction so they have common denominators
3. Add and Subtract
4. Simplify, if needed

Example 4.

$\frac{3}{4} + \frac{3}{8}$

LCM? 8

$\frac{3}{4} x \frac{2}{2} = \frac{6}{8} \quad and \ \frac{3}{8} \quad = \quad \frac{6}{8} + \frac{3}{8} = \frac{9}{8} = 1\frac{1}{8}$

Question: Can you think of a real world problem when you would add $\frac{3}{4} and \frac{3}{8}$? Mrs. Manty walked 3/4 of a mile to the store. Then she walked 3/8 of a mile to the movie theater. How far did Mrs. Manty walk.

Example 5.

$\frac{5}{6} - \frac{3}{4} =$

LCM? 12

$$\begin{array}{rl} \frac{5}{6} \cdot \frac{2}{2} = \frac{10}{12} & \text{renamed } \frac{5}{6} \\ -\frac{3}{4} \cdot \frac{3}{3} = \frac{9}{12} & \text{renamed } \frac{3}{4} \\ \hline \frac{1}{12} & \text{subtracted} \end{array}$$

Example 6.

$8\frac{2}{3} - 5\frac{1}{6} =$

First, rewrite the fraction parts so they have common denominators.

LCM? 6

$$\begin{array}{rl} 8\frac{2}{3} = 8\frac{4}{6} & \text{renamed } 8\frac{2}{3} \\ -\ 5\frac{1}{6} = 5\frac{1}{6} & \\ \hline 3\frac{3}{6} = \mathbf{3\frac{1}{2}} & \text{subtracted and simplified} \end{array}$$

Question: How do you add or subtraction fractions with more than 2 fractions? The same

Remember from Lesson 27, we can use prime factorization to find the LCM. If the denominators are larger, it'll be easier to find the LCM if we use prime factorization.
Example 7.
Use prime factorization to help you add $\frac{5}{32} + \frac{7}{24}$

$$\begin{array}{lcccccccccccc} \text{Factors of 32:} & 2 & \cdot & 2 & \cdot & 2 & \cdot & 2 & \cdot & 2 & & & \\ \text{Factors of 24:} & & & & & 2 & \cdot & 2 & \cdot & 2 & \cdot & 3 \\ & \downarrow & & \downarrow & & \downarrow & & \downarrow & & \downarrow & & \downarrow \\ \text{LCM 32, 24:} & 2 & \cdot & 2 & \cdot & 2 & \cdot & 2 & \cdot & 2 & \cdot & 3 \end{array}$$

$$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 3 = 96$$

$\frac{5}{32} x \frac{3}{3} = \frac{15}{96}$ $\quad$ $\frac{7}{24} x \frac{4}{4} = \frac{28}{96}$ $\quad$ $\frac{15}{96} + \frac{28}{96} = \frac{43}{96}$

CW: 1-3, 7-9, 11, 15-16, 21-28

HW: 4-6, 10, 12-14, 17-20, 29-30