Math: Fractions Session #7

Adding mixed numbers with different denominators
must have common denominators for all fractions involved. Scale up one or both as needed to make the denominators the same:

$$4\frac{1}{8}$$

$$+ \quad 3\frac{5}{6}$$

$\rightarrow$

$$4\frac{1}{8} = 4\frac{}{24}$$

$$+ \ 3\frac{5}{6} = 3\frac{}{24}$$

$\rightarrow$

$$4\frac{1}{8} \quad \overset{\times 3}{\underset{\times 3}{=}} \quad 4\frac{3}{24}$$

$$+ \ 3\frac{5}{6} \quad \overset{\times 4}{\underset{\times 4}{=}} \quad 3\frac{20}{24}$$

Subtraction Sometimes, the fraction part of the mixed number is smaller than the number you are subtracting from it, so borrow a unit from the whole number to bump up the fraction part.

1. Take 1 away from the whole number

2. Add 1 to the fraction part, in this example, it's $\frac{7}{7}$:

$$3\frac{2}{7} = 2\frac{9}{7}$$

$$-\quad 1\frac{4}{7} = 1\frac{5}{7}$$

$$\overline{\qquad\quad 1\frac{5}{7}}$$

$$\begin{array}{r} 5 \\ -\quad 2\frac{2}{3} \\ \hline \end{array} \quad\longrightarrow\quad \begin{array}{r} 4\frac{3}{3} \\ -\quad 2\frac{2}{3} \\ \hline 2\frac{1}{3} \end{array}$$

Multiplying mixed numbers is easiest if you change the mixed numbers to improper fractions, and then multiply the fractions together. As a last step, convert the improper fraction back into a mixed number.

$$\frac{2}{15} \times 10 = \frac{2}{15} \times \frac{10}{1} = \frac{20}{15} = \frac{4}{3} = 1\frac{1}{3}$$

$$1\frac{1}{5} \times \frac{3}{7} = \frac{6}{5} \times \frac{3}{7} = \frac{6 \times 3}{5 \times 7} = \frac{18}{35}$$

Dividing mixed numbers is easiest if you change the mixed numbers to improper fractions, and then divide the fractions (don't forget to flip the second fraction when you turn division into a multiplication!) As a last step, convert the improper fraction back into a mixed number.

$$\frac{3}{4} \div \frac{2}{9} = \frac{3}{4} \times \frac{9}{2} = \frac{27}{8} = 3\frac{3}{8}$$

$$5\frac{1}{8} \div \frac{3}{2} = \frac{41}{8} \times \frac{8}{3} = \frac{41}{12} = 3\frac{5}{12}$$