Study Guide for Unit 4 Lesson 6

Lesson 6-Fraction Concepts

<mark>Improper Fractions & Mixed Numbers</mark>

*An <u>improper fraction</u> has a numerator greater than its denominator. Sometimes we say the fraction is top heavy.
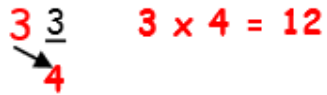
$$\frac{12}{8}$$

*A <u>mixed number</u> has a whole number and a fraction.

$$1\frac{5}{6}$$

Converting to Mixed Numbers to Improper Fractions

*Use multiplication to convert a mixed number into an improper fraction.

Step 1: Multiply the whole number by the denominator.

$3\dfrac{3}{4}$ 3 x 4 = 12
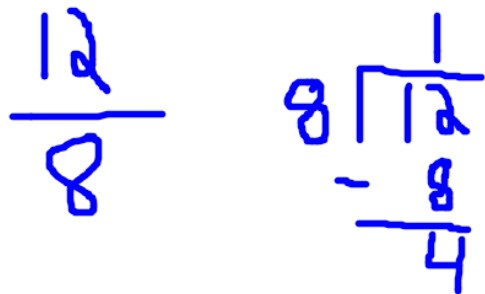
Step 2: Add your answer to the numerator

12 + 3 = 15

Step 3: Put the new numerator over the old denominator.

$\dfrac{15}{4}$

Converting Improper Fractions to Mixed Numbers

*Use division

Step 1: Divide the numerator by the denominator

$$\dfrac{12}{8} \qquad 8\overline{)12} \\ \underline{-\ 8} \\ 4 \quad \text{r} 1$$

Step 2: Write the remainder as a fraction (over the denominator)

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

Step 3:   Write your answer as a mixed number and simplify if needed.

$$1\,\frac{4 \div 4}{8 \div 4} = 1\,\frac{1}{2}$$

How to form equivalent fractions

Step 1: Multiply or divide both the numerator and denominator by the same number.

Step 2: Write the new fraction.

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

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

$$\frac{56}{72} = \frac{56 \div 8}{72 \div 8} = \frac{7}{9}$$

$$\frac{56}{72} = \frac{7}{9}$$

How to tell if you have equivalent fractions

Step 1: Cross Multiply

Step 2: Compare the two products.

Step 3: If the products are equal, the fractions are equivalent.
Otherwise they are not.

$$2 \times 10 = 20 \qquad 5 \times 4 = 20$$

$$\frac{2}{5} \qquad \frac{4}{10}$$

$$20 = 20 \text{ so } \frac{2}{5} = \frac{4}{10}$$

Step 1: Write the two fractions

$$\frac{4}{5} \qquad \frac{3}{7}$$

Step 2: Cross multiply

$$28 \quad \frac{4}{5} \bowtie \frac{3}{7} \quad 15$$

Step 3: Compare the two numbers

28 is larger than 15, so ....

$$\frac{4}{5} > \frac{3}{7}$$

There is one method that uses the GCF.

SIMPLIFYING FRACTIONS

Divide by the GCF.

$$\frac{25}{75}$$

1. Find the GCF of 25 and 75 by listing factors, using prime factorization or Tic-Tac-Toe.

   25: 1, 5, 25
   75: 1, 3, 5, 15, 25, 75

2. Divide the numerator and denominator by their GCF.

   $$\frac{25}{75} \div \frac{25}{25} = \frac{1}{3}$$

There is another method that uses the Cake Method.

1. Take the fraction ⟶ $\dfrac{24}{36}$

2. Write it horizontally ⟶ 24   36

3. Put Bars on the numbers ⟶ 24   36

4. Start with 2, can they both be divided by 2? In this case yes. Do the division ⟶

2	24 36
	12 18

5. Can they both be divided by 2 again? In this case yes. do the division by adding more bars. ⟶

2	24 36
2	12 18
	6 9

6. Can they both be divided by 2 again? In this case no. move on to 3, can they both be divided by 3? Yes. Add more bars and divide. ⟶

2	24 36
2	12 18
3	6 9
	2 3

> It's called the Cake method because the lines looks like layers of a cake

7. Can they both be divided by 3 again? no. 4? 5? 6? No. Since they can only be divided by 1 we know we are done ⟶

2	24 36
2	12 18
3	6 9
	2 3 $= \dfrac{2}{3}$

8. Your ANSWER. ⟶ $\dfrac{24}{36} = \dfrac{2}{3}$

Practice:

Section 1: Simplify the fractions:

1) $\frac{40}{50} = \underline{}$
2) $\frac{8}{16} = \underline{}$
3) $\frac{6}{9} = \underline{}$

Section 2: Are the following fractions equivalent?

A) Choose the correct equivalent fraction in each problem.

1. $\frac{2}{16} = ?$ a) $\frac{1}{4}$ b) $\frac{1}{8}$ c) $\frac{4}{20}$ d) $\frac{3}{18}$

2. $\frac{1}{3} = ?$ a) $\frac{3}{15}$ b) $\frac{2}{14}$ c) $\frac{8}{24}$ d) $\frac{5}{10}$

3. $\frac{25}{10} = ?$ a) $\frac{5}{2}$ b) $\frac{10}{16}$ c) $\frac{1}{5}$ d) $\frac{30}{20}$

Section 3: Compare the fractions:

Write the Correct Comparison Symbol (>, < or =) in Each Box

1) $\frac{2}{9}$ ☐ $\frac{3}{7}$ 2) $\frac{4}{5}$ ☐ $\frac{10}{11}$

Section 4: Converting the fractions:

Converting Improper Fractions to Mixed Numbers

1) $\dfrac{11}{2}$ = ___ 2) $\dfrac{31}{5}$ = ___ 3) $\dfrac{25}{10}$ = ___

Converting Mixed Numbers to Improper Fractions

1) $6\dfrac{3}{10}$ = ___ 2) $5\dfrac{2}{3}$ = ___ 3) $7\dfrac{4}{5}$ = ___

Additional Resources:

http://interactivesites.weebly.com/fractions.html

http://www.aasd.k12.wi.us/staff/boldtkatherine/mathresources3-6/math_fractions.htm

http://www.sheppardsoftware.com/math.htm

http://www.math-play.com/math-fractions-games.html

https://www.khanacademy.org/math/arithmetic/fractions/Equivalent_fractions/v/equivalent-fractions

https://www.khanacademy.org/math/arithmetic/fractions/Equivalent_fractions/v/fractions-in-lowest-terms

https://www.khanacademy.org/math/arithmetic/fractions/comparing-fractions/v/comparing-fractions

https://www.khanacademy.org/math/pre-algebra/fractions-pre-alg/mixed-numbers-pre-alg/v/converting-mixed-numbers-to-improper-fractions