M7 Notes(Lesson 1-2) Date_____

(Complex Fractions and Unit Rates)

Review Multiplication of Fractions

*Write both numbers in "fraction" form

*Try to "simplify" factors in numerator with factors in denominator

$\frac{5}{10} \cdot \frac{6}{12} = \frac{2}{6}$

*Multiply numerators, Multiply denominators.

*Check that answer is simplified (no improper fractions and no common factors)

$2\frac{1}{4} \cdot \frac{8}{9}$

$\frac{9}{4} \cdot \frac{8^2}{9_1}$

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

$3\frac{1}{2} \cdot 4$

$\frac{7}{2} \cdot \frac{4^2}{1}$

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Review Division of Fractions

*Write both numbers in "fraction" form

*1st # stays the same Keep

*Change ÷ sign to • sign

*Write the reciprocal of the 2nd number Flip

*Try to "simplify" factors in numerator with factors in denominator

*Multiply numerators, Multiply denominators

*Check that answer is simplified (no improper fractions and no common factors)

$6\frac{1}{2} \div \frac{2}{5}$

$\frac{13}{2} \div \frac{2}{5}$

$\frac{13}{2} \cdot \frac{5}{2}$

$\frac{65}{4} = 16\frac{1}{4}$

$\frac{3}{5} \div 15$

$\frac{3}{5} \div \frac{15}{1}$

$\frac{1}{3} \cdot \frac{1}{15_5}$

$\frac{1}{25}$

$25\% = \frac{25}{100} = \frac{1}{4}$

Complex fractions are fractions with one or more fractions (or decimals) in the numerator, denominator, or both. Complex fractions are simplified when both the numerator and denominator are integers. $\frac{1.5}{10}$ $\frac{1\frac{1}{2}}{15}$ $\frac{\frac{3}{4}}{3\frac{1}{2}}$

Integers = Whole #'s + Their Opposites {...-2,-1,0,1,2,...}

To simplify a complex fraction, rewrite it as a division problem.

Examples

$\frac{\frac{5}{8}}{\frac{15}{16}} = \frac{5}{8} \div \frac{15}{16}$

$\frac{1}{5} \cdot \frac{2}{16} = \frac{2}{3}$

$\frac{\frac{3}{5}}{10} = \frac{3}{5} \div 10$

$\frac{3}{5} \div \frac{10}{1}$

$\frac{3}{5} \cdot \frac{1}{10}$

$\frac{3}{50}$

There are some **percents** that become complex fractions when we write them as a simplified ratio.

$9\frac{1}{6}\% = \frac{9\frac{1}{6}}{100}$

$9\frac{1}{6} \div 100$

$\frac{55}{6} \div \frac{100}{1}$

$\frac{11}{6} \cdot \frac{1}{20}$

$\frac{11}{120}$

$33\frac{1}{3}\% =$

$\frac{33\frac{1}{3}}{100} =$

$33\frac{1}{3} \div 100$

$\frac{100}{3} \div \frac{100}{1}$

$\frac{1}{3} \cdot \frac{1}{100_1}$

$\frac{1}{3}$

$1\frac{1}{8}\% =$

$\frac{1\frac{1}{8}}{100} = 1\frac{1}{8} \div 100$

$\frac{9}{8} \div \frac{100}{1}$

$\frac{9}{8} \cdot \frac{1}{100}$

$\frac{9}{800}$

Simplify

$\dfrac{\frac{1}{3}}{4\frac{1}{2}}$

$\frac{1}{3} \div 4\frac{1}{2}$

$\frac{1}{3} \div \frac{9}{2}$

$\frac{1}{3} \cdot \frac{2}{9}$

$\frac{2}{27}$

$12\frac{1}{2}\%$

$\frac{12\frac{1}{2}}{100} =$

$12\frac{1}{2} \div 100$

$\frac{25}{2} \div \frac{100}{1}$

$\frac{25}{2} \cdot \frac{1}{100}$

$\frac{1}{8}$

$6\frac{1}{8}\%$

$\frac{6\frac{1}{8}}{100} = 6\frac{1}{8} \div 100$

$\frac{49}{8} \div \frac{100}{1}$

$\frac{49}{8} \cdot \frac{1}{100}$

$\frac{49}{800}$

Sometimes the calculation of a unit rate requires the use of complex fraction concepts.

Jack jogs $1\frac{1}{3}$ miles in $\frac{1}{4}$ hour. Find his average speed in miles per hour.

$\dfrac{\text{miles}}{\text{hour}} \quad \dfrac{1\frac{1}{3}}{\frac{1}{4}} = 1\frac{1}{3} \div \frac{1}{4}$

$= \frac{4}{3} \div \frac{1}{4}$

$= \frac{4}{3} \cdot \frac{4}{1}$

$= \frac{16}{3} = 5\frac{1}{3}$ mi/hr

It takes Tia $\frac{3}{4}$ hour to paint $34\frac{1}{2}$ square feet. At this rate, how many square feet can she paint in an hour?

$\dfrac{\text{sq ft}}{\text{hour}} \quad \dfrac{34\frac{1}{2}}{\frac{3}{4}} = 34\frac{1}{2} \div \frac{3}{4}$

$= \frac{69}{2} \div \frac{3}{4}$

$= \frac{69}{2} \cdot \frac{4}{3}$

$= 46$ sq ft/hr or 46 ft^2/hr