Q. If both numerator and denominator of a fraction be divided by the same number, how will the value of the resulting fraction compare with the value of the original fraction? A. The value of the two fractions will be the same, because dividing a given number by any number and multiplying the result by the same number will produce the given number; e. g.,

e.g. $24 \div 6 = 4$ and $4 \times 6 = 24$

e. g. $\dfrac{6 \div 2}{8 \div 2} = \dfrac{3}{4}$. In $\frac{3}{4}$ there are half as many pieces as in $\frac{6}{8}$, but each quarter is twice as large as an eighth.

Cancelling.

The two principle upon which cancelling depends are: Dividing both numerator and denominator of a fraction by the same number does not change the value of the fraction. And, when any number of factors are to be multiplied and the product is to be divided by a given number the result will be the same if one of the factors can be divided by the given number before multiplying.

e. g. $\dfrac{6}{7} \times \dfrac{5}{9} = \dfrac{30}{63}; \dfrac{30 \div 3}{63 \div 3} = \dfrac{10}{21}$

$\dfrac{6}{7} \times \dfrac{5}{9} = \dfrac{6 \times 5}{7 \times 9} = \dfrac{(6 \div 3) \times 5}{7 \times (9 \div 3)} = \dfrac{2 \times 5}{7 \times 3} = \dfrac{10}{21}$

That is cancel by striking out of the numerator 6 and the denominator 9, the common factor 3, then multiply as before.

To Reduce Compound Fractions to Simple Fractions.

A compound fraction is a fraction of a fraction, e.g., $\frac{2}{3}$ of $\frac{7}{11}$.

Q. If I want two-thirds of any number what should I first get? A. One-third.

Q. How can I find $\frac{1}{3}$ of any number? A. Divide the number into three equal parts.

Q. Find $\frac{1}{3}$ of 12? A. $\frac{1}{3}$ of 12 is four.

Q. How is $\frac{1}{3}$ of any number found? A. By dividing the number by three.

Q. Find $\frac{1}{3}$ of $\frac{7}{11}$? A. $\frac{1}{3}$ of $\frac{7}{11}$ is $\frac{7}{11} \div 3$.

Q. How can I divide $\frac{7}{11}$ by 3? A. By multiplying the denominator by 3 thus $\frac{7}{11} \div 3 = \frac{7}{33}$.

Q. If $\frac{7}{33}$ is $\frac{1}{3}$ of $\frac{7}{11}$ how can I get $\frac{2}{3}$ of $\frac{7}{11}$? A. By multiplying $\frac{7}{33}$ by 2, thus $\frac{7}{33} \times 2 = \frac{14}{33}$, therefore $\frac{2}{3}$ of $\frac{7}{11} = \frac{14}{33}$.

Q. By examining the above give rule for reducing a compound fraction to a simple fraction. A. To reduce a compound fraction to a simple fraction multiply the numerators for a numerator and multiply the denominators for a denominator.

To Reduce Complex Fraction to a Simple Fraction.

A complex fraction is one having a simple fraction, a compound fraction or a mixed number for one or for both of its terms.

Examples of complex fractions:

$\dfrac{3}{4\frac{1}{2}}, \dfrac{\frac{1}{2}}{4}, \dfrac{\frac{1}{2}}{\frac{1}{2}}, \dfrac{\frac{1}{2} \text{ of } \frac{1}{2}}{7\frac{1}{2}}$

Find the value of $\frac{21}{4}$.

Q. How many quarters are there? A. 21 quarters.

Q. How many quarters make a unit? A. 4 quarters.

Q. How many times can four quarters be obtained from 21 quarters? A. As many times as 21 will contain 4, which is five times; therefore $\frac{21}{4}$ will make 5 units.

Q. After making 5 units out of $\frac{21}{4}$ how many quarters will be left? A. $\frac{1}{4}$.

therefore $\frac{21}{4} = 21 \div 4 = 5\frac{1}{4}$.

Q. How may the value of a fraction be found? A. By dividing the numerator by the denominator.

Find the value of $\dfrac{4\frac{1}{2}}{5\frac{1}{2}}$.

$\dfrac{4\frac{1}{2}}{5\frac{1}{2}} = 4\frac{1}{2} \div 5\frac{1}{2} = \frac{9}{2} \div \frac{11}{2} = \frac{9}{2} \times \frac{2}{11} = \frac{9}{11}$.

A complex fraction may be reduced to a simple fraction by multiplying both numerator and denominator by some number that will clear them of fractions; e. g., to reduce $\dfrac{2\frac{1}{2}}{3\frac{1}{2}}$.

To find the number by which to multiply both numerator and denominator so as to clear both of fractions proceed as follows:

Q. By what number or numbers may $\frac{3}{4}$ be multiplied so as to make a whole number?

Arrange thus $\frac{3}{4} \times \frac{?}{?}$ and by applying the principle involved in cancelling it will be seen that $\frac{3}{4}$ can be changed to a whole number by multiplying by 4, 8, 12, 16, or any multple of 4. And that $\frac{1}{5}$ may be changed to a whole number by multiplying it by any multiple of 5. Therefore both $\frac{3}{4}$ and $\frac{1}{5}$ may be made into whole numbers by multiplying both by a common multiple of 4 and 5. The L. C. M. is best, that is in this case 20:

$\dfrac{2\frac{3}{4} \times 20}{3\frac{4}{5} \times 20} = \dfrac{55}{76}$.

A PORTRAIT FROM LIFE

Little Marion was doing her best to keep her father from being lonely, while he was trimming the shrubbery in the front yard. To every remark she made, her father responded with "M-hm, M-hm."

After enduring this mode of conversation as long as she possibly could, Marion looked up and said, "Daddy, you talk for a while and let me say 'M-hm'!"