Clearing Fractions (Kung Fu Fractions)

Objective 1

Recognize when a Whole Number times a Fraction is a Whole Number

Consider the product $12\left(\frac{4}{3}\right)$. Will the result be a whole number or a fraction?

Writing 12 as a fraction and multiplying will get us the result.

$$12\left(\frac{4}{3}\right)=\frac{12}{1}\cdot\frac{4}{3}=\frac{\cancel{12}^{4}}{1}\cdot\frac{4}{\cancel{3}_{1}}=\frac{16}{1}=16$$

Notice that the result above was a whole number. This was because the denominator of the fraction divided evenly into the whole number.

When finding the product of a **whole number** and **fraction**, if the denominator of the fraction divides evenly into the whole number, the result will be a **whole number**. If the denominator does not divide evenly into the whole number, the result will be a **fraction**.

Consider the product $8\left(\frac{5}{2}\right)$. Will the result be a whole number or a fraction?

With $8\left(\frac{5}{2}\right)$ we say to ourselves, "2 goes into 8 four times, and four times 5 is 20". Therefore $8\left(\frac{5}{2}\right)=20$. We could use the following short hand notation. Can you see how this works?

$$\overset{4}{\cancel{8}}\left(\frac{5}{\cancel{2}_{1}}\right)=20$$

With lots of mental practice we can read off answers very quickly. In this case we say we used "Kung Fu math" to clear the fraction.

Example 1: Use "Kung Fu math" to find each product.

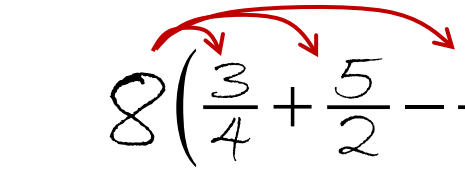
a) $9\left(\frac{4}{3}\right)$ b) $14\left(\frac{4}{7}\right)$ c) $10\left(\frac{5}{2}\right)$ d) $18\left(\frac{7}{6}\right)$

Consider the product $7\left(\frac{3}{2}\right)$. Will the result be a whole number or a fraction?

In this case, the result will be a fraction since the denominator does not divide evenly into the whole number. We must proceed as follows. $7\left(\frac{3}{2}\right)=\frac{7}{1}\cdot\frac{3}{2}=\frac{21}{2}$ or $10\frac{1}{2}$

Now consider $8\left(\frac{3}{4}+\frac{5}{2}-\frac{11}{8}\right)$. Notice that the denominators of the fractions within the parenthesis divide evenly into the whole number 8. In this case it may be easier to distribute the 8 rather than simplifying the expression within the parenthesis using an LCD. This process is demonstrated below.

$$8\left(\frac{3}{4}+\frac{5}{2}-\frac{11}{8}\right)$$



$$\overset{2}{\cancel{8}}\left(\frac{3}{\underset{1}{\cancel{4}}}\right)+\overset{4}{\cancel{8}}\left(\frac{5}{\underset{1}{\cancel{2}}}\right)-\overset{1}{\cancel{8}}\left(\frac{11}{\underset{1}{\cancel{8}}}\right)$$

$$6+20-11$$

$$\boxed{15}$$

The more you practice this "math Kung Fu" technique, the faster you will get. A "Kung Fu math" black belt will solve the problem in two steps! $8\left(\frac{3}{4}+\frac{5}{2}-\frac{11}{8}\right)=6+20-11=\boxed{15}$

Example 2: Use "Kung Fu math" to simplify the expressions to a whole number.

a) $16\left(\frac{15}{8}-\frac{1}{2}-\frac{3}{4}\right)$ b) $12\left(2-\frac{5}{3}+\frac{3}{6}\right)$

Answer the following homework questions.

In Exercises 1 – 12, simplify each expression.

1) $16\left(\frac{3}{4}\right)$

2) $24\left(\frac{5}{8}\right)$

3) $5\left(\frac{1}{2}\right)$

4) $3\left(\frac{7}{6}\right)$

5) $5\left(\frac{1}{10}-\frac{1}{15}\right)$

6) $18\left(\frac{5}{9}-\frac{1}{6}\right)$

7) $36\left(\frac{7}{12}-\frac{11}{18}\right)$

8) $100\left(\frac{13}{20}-\frac{27}{50}\right)$

9) $63\left(\frac{2}{7}-\frac{2}{9}-\frac{2}{21}\right)$

10) $30\left(\frac{21}{15}-3+\frac{11}{5}\right)$

11) $20\left(\frac{6}{5}-5+8\right)$

12) $36\left(5+\frac{6}{12}-8\right)$