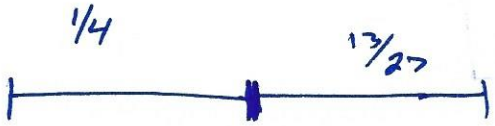
Van Miller
MATH 1350
Math for Elem. School Teachers
Dr. Alm 10- -18

HW: Ch. 14 → 1, 2, 4, 7, 11, 12
Ch. 15 → 1, 6, 10

Fraction Addition:

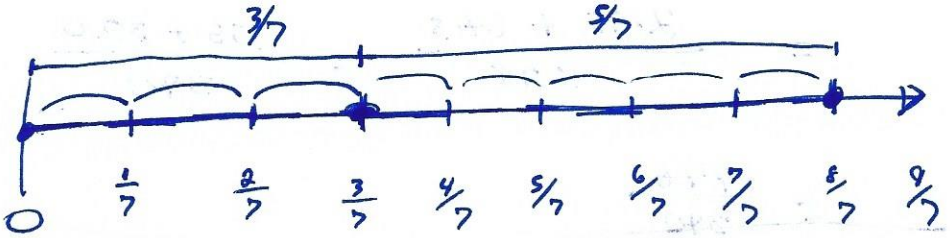
$\frac{1}{4} + \frac{13}{27}$ is defined to be the length of the line segment one gets by concatenating a line segment of length $\frac{1}{4}$ with a line segment of length $\frac{13}{27}$,



How to compute the sum of 2 fractions:

Denominators equal:

$$\frac{3}{7} + \frac{5}{7} = \frac{3+5}{7} = \frac{8}{7}$$



So, $\frac{m}{d} + \frac{n}{d} = \frac{m+n}{d}$,

because we are just counting m-steps followed by n-steps, along the sequence of $\frac{1}{d}$'s.

The point is that two fractions with the same denominator is a straight forward addition process. The addition is similar to adding whole #'s, except on a different sequence than the whole #'s.

Ex.

$$\frac{3}{4} + \frac{80}{4} = \frac{83}{4} = \frac{83 \cdot 25}{4 \cdot 25} = \frac{2075}{100} = 20.75$$

(turning into decimal fraction; dollars)

Non-common denominator:

(1.) Find a common denominator!

(2.) Solve like before. ☺

Ex.

$$\frac{2}{5} + \frac{64}{78} = \frac{2 \cdot 78}{5 \cdot 78} + \frac{64 \cdot 5}{78 \cdot 5}$$

$$= \frac{2 \cdot 78 + 64 \cdot 5}{5 \cdot 78} = \frac{156 + 320}{390}$$

$$= \frac{476}{390}$$

Common Denom.

$$\begin{array}{r} 478 \\ \times\ 5 \\ \hline 390 \end{array}$$

In summary,

$$\frac{m}{n} + \frac{k}{l} = \frac{ml + kn}{nl}$$, where m, n, k, l are whole #'s.

Finding the least common denominator isn't required! If a student sees the "trick" then great! You can give examples that lead them into the least common denominator, such as:

a.) $\frac{1}{2} + \frac{1}{4}$

b) $\frac{1}{10} + \frac{5}{100}$

c.) $\frac{3}{12} + \frac{2}{9}$

$$\frac{123}{456} + \frac{789}{101} = \frac{123 \cdot 101 + 789 \cdot 456}{456 \cdot 101} = \frac{372,207}{46056}$$

⊗ Don't be shy about giving students large #'s. ⊗

Addition of Decimals:

$$3.013 + 4.2 = \begin{array}{r} 3.013 \\ +4.200 \\ \hline 7.213 \end{array}$$ ← But, why?

decimal fraction

$$3.013 + 4.2 = \frac{3013}{1000} + \frac{42}{10} = \frac{3013}{1000} + \frac{42 \cdot 100}{10 \cdot 100}$$

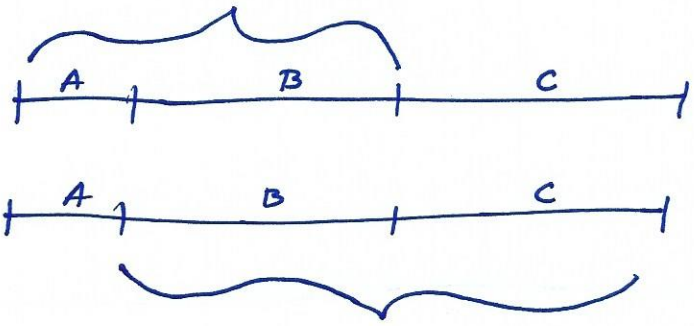
$$= \frac{3013}{1000} + \frac{4200}{1000}$$

$$= \frac{7213}{1000} = 7.213$$

Associative Law:

For any fractions A, B, C,

$$(A + B) + C = A + (B + C)$$



Commutative Law:

$$A + B = B + A$$

For any fractions $A + B$,