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MATH 1350
Math for Elem. School Teachers
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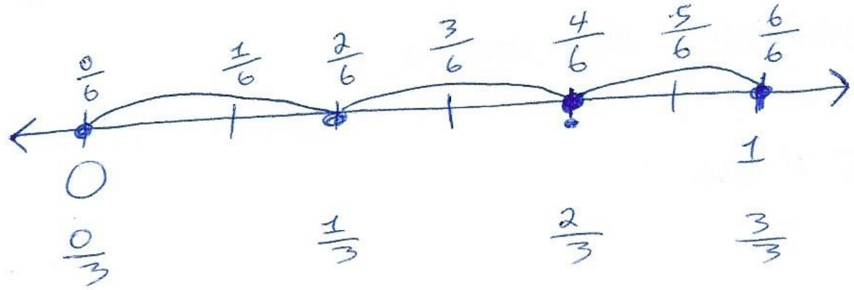
If $\frac{m}{n}$ is a fraction, it is said to be in lowest terms if there is no whole number $c>1$ that divides both m + n.

$\boxed{\text{Ex.}}$ $\frac{4}{6}$



Since, $\frac{4}{6}$ and $\frac{2}{3}$ ~~is~~ are the same point on the number line

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

How does "cancellation" fit in this?

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

Theorem of Equivalent Fraction:

If $\frac{m}{n}$ is a fraction and $c>0$ is a whole number,

$$\frac{m}{n}=\frac{cm}{cn}$$

Reason:

For concreteness, Let $c=5$.
Then, to get from 0 to $\frac{m}{n}$, we take m steps to the right of 0 of length $\frac{1}{n}$.
If instead we take steps of length $\frac{1}{5n}$, it will now take $5m$ steps to reach $\frac{m}{n}$.
So, $\frac{m}{n}=\frac{5m}{5n}$.

Explain to a 5^{th} grader, why $\frac{1}{2} = \frac{5}{10}$:

Write $\frac{3}{5}$ as a decimal fraction and its decimal notation:

$$\frac{3}{5} = \frac{2 \times 3}{2 \times 5} = \frac{6}{10} = 0.6$$

Write $\frac{28}{35}$ as a decimal:

$$\frac{28}{35} = \frac{\cancel{7} \times 4}{\cancel{7} \times 5} = \frac{4}{5} = \frac{2 \times 4}{2 \times 5} = \frac{8}{10} = 0.8$$

Note:

Decimal terminates when,
the fraction is of form.

$$\frac{n}{2^k \cdot 5^j},$$ where K and j are whole #'s & $K=j$.

$$\frac{3}{25} = \frac{3}{5 \cdot 5} = \frac{2 \times 2 \times 3}{2 \times 2 \times 5 \times 5} = \frac{12}{100}$$

Extra: Euclidean Alg.

$\frac{48}{62}$

$62 = 1 \times 48 + 14$

$48 = 3 \times 14 + 2$

$14 = 7 \times 2 + 0$

$$\frac{48}{62} = \frac{\cancel{2} \times 24}{\cancel{2} \times 31} = \frac{24}{31}$$

Fundamental Fact of Fraction Pairs

Any two fractions can be put "on the same scale", i.e, given a common denominator.

The common denominator can ALWAYS be taken to be the product of the two denominators.

If $\frac{m}{n}$ and $\frac{a}{b}$ are the fractions, then

$$\frac{m}{n} = \frac{mb}{nb} \quad \& \quad \frac{a}{b} = \frac{an}{bn}$$

have the same denominator.

Which is bigger?

$\frac{4}{7}$ or $\frac{3}{5}$?

$$\frac{4}{7} = \frac{4 \times 5}{7 \times 5} = \frac{20}{35}$$

$$\frac{3}{5} = \frac{3 \times 7}{5 \times 7} = \frac{21}{35}$$

$\boxed{\text{So, } \frac{3}{5} > \frac{4}{7}.}$