

Math 8 - Chapter 3 notes

* Review of adding & subtracting Fractions

Rule #1 - to be able to add or subtract fraction both denominators (bottoms) have to be the same!

To make the denominators the same you find the lowest common multiple
for example

$$\frac{1}{4} + \frac{1}{2}$$

The multiples of 4 are:

4, 8, 12, 16, ...

The multiples of 2 are:

2, 4, 6, 8, ...

The lowest common multiple is 4.

So the new denominator will be 4

$$\frac{1}{4} + \frac{1}{2} = \frac{1}{4} + \frac{\quad}{4}$$

this is already 4 so you don't have to do anything

but this was 2
Ask what do I multiply 2 by to get 4?
* don't forget you have to multiply the top too =

$$\frac{1}{2} \times 2 = \frac{2}{4}$$

So now you have common denominators & you can add the tops
(remember once the denominators are the same - it stays the same in the answer)

$$\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$$

ex 2

$$\frac{3}{5} - \frac{2}{3} = \frac{(\times 3) 3}{(\times 3) 5} - \frac{2(\times 5)}{3(\times 5)} = \frac{9}{15} - \frac{10}{15} = \frac{-1}{15}$$

to make 5 = 15
 $\times 3$

to make 3 = 15
 $\times 5$

Lowest common multiple = 15

Terms to remember:

- ① numerator = top of the fraction
- ② denominator = bottom of the fraction
- ③ equivalent = same value (ex $\frac{1}{2} = \frac{2}{4} = \frac{5}{10}$)
- ④ improper fractions = top is bigger than the bottom (ex $\frac{5}{4}$ or $\frac{12}{5}$)
- ⑤ mixed number = a number + a fraction
($1\frac{4}{5}$ or $2\frac{3}{7}$)

Also

- any whole number can be written as a fraction by making it over 1

$$2 = \frac{2}{1} \quad ; \quad 734 = \frac{734}{1}$$

* Don't make the denominators equal *

To multiply Fractions

Rule #1 * Must only have a numerator & denominator (mixed #'s not allowed)
- so change all mixed numbers into improper fractions
(Same rule for dividing too)
→ then all you do is multiply straight across

ex 1

$$\frac{1}{2} \times \frac{3}{4} = \frac{1 \times 3}{2 \times 4} = \frac{3}{8}$$

ex 2

$$1\frac{1}{2} \times \frac{2}{5} = \frac{3}{2} \times \frac{2}{5} = \frac{6}{10} \quad (\text{don't forget to reduce})$$

change into improper fraction. →

$$= \frac{3}{5} \quad \leftarrow \div 2$$

* Don't make denominators equal *

To Divide Fractions (multiply by reciprocal)

* numbers must be in fraction form
- no mixed numbers allowed.

→ To divide; flip over the 2nd fraction & then multiply.

$$\frac{1}{2} \div \frac{1}{4} = \frac{1}{2} \times \frac{4}{1} = \frac{4}{2} = 2$$

$$1\frac{2}{3} \div \frac{1}{2} = \frac{5}{3} \div \frac{1}{2} = \frac{5}{3} \times \frac{2}{1} = \frac{10}{3} = 3\frac{1}{3}$$

Vocab *
The flipped fraction is called the reciprocal

Word problems & fractions

Mult
looking for
total

look for the following situations:

of means - multiply

$$\frac{1}{4} \text{ of } 64 = \frac{1}{4} \times 64 = \frac{1}{4} \times \frac{64}{1} = \frac{64}{4} = 16$$

Divide
total \div pieces

* When the question starts with a load or bunch of something and then will separate it out - this means divide

$10\frac{3}{8}$ loads of dirt

Each planter takes $1\frac{1}{2}$ loads

$$\begin{aligned} 10\frac{3}{8} \div 1\frac{1}{2} &= \frac{83}{8} \div \frac{3}{2} = \frac{83}{8} \times \frac{2}{3} = \frac{166}{24} \\ &= 6\frac{22}{24} \text{ *about 7 filled} \end{aligned}$$

Finally

To convert from a fraction to a decimal

* divide top by the bottom

$$\frac{4}{7} = 4 \div 7 = 0.571$$

To make a decimal into a fraction remember place value.

$$\begin{array}{c} \frac{\quad}{\downarrow} \\ \frac{\quad}{10} \end{array} \quad \begin{array}{c} \frac{\quad}{\sim} \\ \frac{\quad}{100} \end{array} \quad \text{so } 0.2 = \frac{2}{10} \text{ \& } 0.37 = \frac{37}{100}$$