



Fractions & Decimals: Notes

Fractions:

Fractions: - a part over a whole

- format: $\frac{a}{b}$
a (part)
b (whole)

Equivalent

Fractions: Fractions that equal each other

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

↳ If you find the LCM, which is 4 and multiply 2 in the numerator and denominator you will get equal fractions

More examples:

$$\frac{3}{4} = \frac{9 \div 3}{12 \div 3} = \frac{3}{4}$$

$$\frac{11}{33} = \frac{1 \times 11}{3 \times 11} = \frac{11}{33}$$

Comparing Fractions: Find the LCM of the denominators and compare 2 or more fractions to see if they are equal, greater than, or less than

Example: $\frac{3}{12} \stackrel{?}{=} \frac{1}{6}$

$$\frac{3}{12} \stackrel{?}{=} \frac{1 \times 2}{6 \times 2} = \frac{2}{12}$$

$$\frac{3}{12} > \frac{2}{12}$$

1. Make the fractions equivalent (common denominator)

2. Find the new fraction and compare it to the other fraction

3. Find answer



Operations With Fractions:

Adding & Subtracting with Like (same) Denominators:

- Keep denominator the same
- Add or subtract numerators as usual

Examples: 

$$\frac{7}{12} + \frac{2}{12} = \frac{9}{12} \text{ or } \boxed{\frac{3}{4}}$$

- Keep 12 the same
- Add $7+2$ to get 9
- Try to keep answer in simplest form

$$\frac{7}{12} - \frac{2}{12} = \boxed{\frac{5}{12}}$$

- keep 12 the same
- subtract $7-2$ to get 5

Adding & Subtracting with Unlike Denominators:

- Use the LCM to find common (same) denominators
- Use new fractions from new denominators
- Add or subtract numerators as usual

Examples: ③

$$\frac{9}{12} + \frac{1}{6}$$

$$\frac{9}{12} + \frac{1}{6} \times \frac{2}{2} = \frac{3}{12}$$

$$\frac{9}{12} + \frac{3}{12} = \frac{11}{12}$$

④

$\frac{1}{3} - \frac{1}{4}$

$$\frac{4}{12} = \frac{4 \times 1}{4 \times 3} - \frac{1 \times 3}{4 \times 3} = \frac{3}{12}$$

$$\frac{4}{12} - \frac{3}{12} = \boxed{\frac{1}{12}}$$

- * You have to have common (same) denominators when adding or subtracting fractions

* Depending on the fractions given, you might need to find 2 new fractions instead of 1, like in example 4

Adding & subtracting with mixed numbers:

- change the mixed numbers to improper fractions (multiply the denominator and whole # then add the numerator)
- Find the LCM and find common denominators
- Add or subtract as usual
- convert answer to simplest form or mixed # (divide w/...)

examples:

$$\therefore \textcircled{5} \quad 1\frac{1}{2} + 2\frac{1}{2}$$

$$\frac{16}{10} = \frac{2 \times 8}{2 \times 5} + \frac{5 \times 5}{2 \times 5} = \frac{75}{10}$$

$$\frac{16}{10} + \frac{25}{10} = \frac{41}{10} = 4\frac{1}{10}$$

6 $2\frac{1}{2} - 1\frac{3}{4}$

$$\begin{array}{r} 25 = 5 \times 5 \\ 10 = 5 \times 2 \end{array} \quad - \quad \begin{array}{r} 8 \times 2 = 16 \\ 5 \times 2 = 10 \\ \hline \end{array}$$

$$\frac{25}{10} - \frac{16}{10} = \boxed{\frac{9}{10}}$$

Multiplying...

Fractions with Whole Numbers:

- put whole number over 1
- multiply numerators with each other & denominators with each other
- convert answer into simplest form (reduce) (if needed)

$$2 \times \frac{1}{5}$$

$$\frac{2}{1} \times \frac{1}{5}$$

$$\boxed{\frac{2}{5}}$$

Fractions with Fractions:

- multiply numerators with each other & denominators with each other
- convert answer into simplest form (reduce) (if needed)

$$\frac{3}{7} \times \frac{1}{2}$$

$$\frac{3 \times 1}{7 \times 2}$$

$$\boxed{\frac{3}{14}}$$

Fractions with Mixed Numbers:

- convert mixed # into an improper fraction
- multiply fraction like you would regularly

$$1\frac{2}{5} \times \frac{1}{3}$$

$$\frac{7}{5} \times \frac{1}{3} = \frac{7 \times 1}{5 \times 3} = \boxed{\frac{7}{15}}$$

Division with Fractions:

- division is just like multiplying fractions, but there is 1 extra step
- once you have the fractions or improper fractions you are dividing, switch the numerator and denominator of the 2nd fraction, then multiply regularly

Examples:

$$2 \div \frac{1}{3}$$

$$\frac{2}{1} \div \frac{1}{3}$$

$$\frac{2}{1} \times \frac{3}{1}$$

$$\frac{6}{1}$$

$$\boxed{6}$$

$$\frac{3}{7} \div \frac{1}{2}$$

$$\frac{3}{7} \times \frac{2}{1}$$

$$\boxed{\frac{6}{7}}$$

$$1\frac{2}{5} \div \frac{1}{3}$$

$$\frac{7}{5} \div \frac{1}{3}$$

$$\frac{7}{5} \times \frac{3}{1}$$

$$\frac{21}{5}$$

$$\boxed{4\frac{1}{5}}$$

Decimals:

Decimals: whole number plus a fraction in decimal form by dividing the denominator into the numerator

Example: $1\frac{1}{2} = 1.5$

$$\begin{array}{r} 0.5 \\ 2 \overline{) 1.0} \\ \underline{1.0} \\ 0 \end{array}$$

operations with decimals...

- operations with decimals are very simple

Adding or subtracting decimals:

- Line up the decimal points vertically
- Add or subtract as usual

Examples: $51.7 + 6.12$

$$\begin{array}{r} 51.70 \\ + 6.12 \\ \hline 57.82 \end{array}$$

$6.12 - 5.1$

$$\begin{array}{r} 6.12 \\ - 5.10 \\ \hline 1.02 \end{array}$$

Multiplying decimals:

- Multiply as if there is no decimal
- Count the number of decimal places in the 2 #'s you are multiplying and skip that many places in your answer

Example: $6.71 \times 5.2 = 34.892$

$$\begin{array}{r} 6.71 \\ \times 5.2 \\ \hline 1342 \\ 33550 \\ \hline 34892 \end{array}$$

Dividing Decimals:

- Multiply the divisor till it is fully a whole number
- Do the same to the dividend, then divide as usual

Example: $2.198 \div 0.07$

$$0.07 \overline{) 2.198} = 31.4 = \boxed{31.4}$$