Notes for Fractions and Decimals

Fractions

- *Addition & Subtraction*: Get a common denominator first.

    Example: $\frac{4}{5} - \frac{2}{7}$

    Solution: $\frac{4 \cdot 7}{5 \cdot 7} - \frac{2 \cdot 5}{7 \cdot 5}$ $\rightarrow$ $\frac{28}{35} - \frac{10}{35}$ $\rightarrow \boxed{\frac{18}{35}}$

- *Multiplication*: Try first to cross cancel, then multiply denominators and numerators.

    Example: $\frac{6}{25} \cdot \frac{7}{8}$

    Solution: $\frac{\overset{3}{\cancel{6}}}{25} \cdot \frac{7}{\underset{4}{\cancel{8}}}$ $\rightarrow \boxed{\frac{21}{100}}$

- *Division*: Flip the second one and then multiply the two fractions.

    Example: $\frac{4}{15} \div \frac{12}{25}$

    Solution: $\frac{4}{15} \cdot \frac{25}{12}$ $\rightarrow$ $\frac{\overset{1}{\cancel{4}}}{\underset{3}{\cancel{15}}} \cdot \frac{\overset{5}{\cancel{25}}}{\underset{3}{\cancel{12}}}$ $\rightarrow \boxed{\frac{5}{9}}$

Mixed numbers

- *Multiplication & Division*: First, convert the mixed numbers into improper fractions.

    Example: $4\frac{2}{3} \cdot 3\frac{3}{4}$

    Solution: $\frac{14}{3} \cdot \frac{15}{4}$ $\rightarrow$ $\frac{\overset{7}{\cancel{14}}}{\underset{1}{\cancel{3}}} \cdot \frac{\overset{5}{\cancel{15}}}{\underset{2}{\cancel{4}}}$ $\rightarrow$ $\frac{35}{2}$ $\rightarrow \boxed{17\frac{1}{2}}$

- *Addition & Subtraction*: It's usually easier to leave them as mixed numbers.

    Example: $26\frac{1}{3} - 24\frac{3}{4}$ (This is the hardest kind of problem!)

    Solution: $26\frac{4}{12} - 24\frac{9}{12}$ $\rightarrow$ (borrow $\frac{12}{12}$ from the 26) $\rightarrow$ $25\frac{16}{12} - 24\frac{9}{12}$ $\rightarrow \boxed{1\frac{7}{12}}$

Decimals

- *Addition & Subtraction*: Line up the decimal points, then do the calculation.

    Example: $57.4 - 4.23$ **Solution:** $\begin{array}{r} 57.40 \\ -\ 4.23 \\ \hline \boxed{53.17} \end{array}$ (don't forget to add the extra zero!)

- *Multiplication*: First do the calculation ignoring the decimals. Add up the number of decimal places in the original problem, and move over the answer's decimal point by that many places.

    Example: $12.34 \cdot 7.042$

    Solution: $1234 \cdot 7042$ is $8,689,828$. We move the decimal 5 places to get $\boxed{86.89828}$

- *Division*: Make the divisor (the outside number) easier by moving the decimal place.

    Example: With $360 \div 0.009$ we change the problem to $360{,}000 \div 9$ (ans: 40,000)

    Example: With $5400 \div 6000$ we change the problem to $5.4 \div 6$ (ans: 0.9)

Short Division   Write the remainders as small digits as you go.

Example: $58741 \div 7$ (leave answer as a mixed number).

Solution: $\boxed{8\ 3\ 9\ 1\ ^4/_7}$ $\leftarrow$ answer   (Note: the final remainder, 4, is written over the divisor, 7, to get $^4/_7$.)

$7 \overline{\smash{)}\,5\ 8\ ^2 7\ ^6 4\ ^1 1}$