

## Rational Numbers

### 10/20 Adding and Subtracting

Fractions: common denominator

add numerators

denominator stays the same

$$\text{Ex: } \frac{3 \times 3}{3 \times 4} + \frac{5 \times 2}{6 \times 2} = \frac{9}{12} + \frac{10}{12} = \frac{19}{12} = 1 \frac{7}{12}$$

Decimals: line up the place values (decimals)

$$\begin{array}{r} \text{Ex: } 5.3 + 1.75 \\ \phantom{5.3} + 1.75 \\ \hline \phantom{5.3} + 5.30 \\ \hline 7.05 \end{array}$$

### multiplying

Fractions: multiply numerators

multiply denominators

\* cross reduce first if possible

$$\text{Ex: } \frac{2}{7} \times \frac{3}{4} = \frac{3}{14}$$

Decimals: the number of decimal places in the factors is the number of decimal places in the product

$$\begin{array}{r} \text{Ex: } 2.31 \\ \times \phantom{2.} 0.6 \\ \hline 1.386 \end{array}$$

### Dividing

Fractions: keep the first fraction

change  $\div$  to  $\times$

flip the second fraction to its reciprocal

$$\text{Ex: } \frac{2}{5} \div \frac{1}{10} = \frac{2}{5} \times \frac{10}{1} = 4$$

Decimals: make the decimal in the divisor a whole number by moving the decimal to the right and move the same number of place values in the dividend

$$\begin{array}{r} \text{Ex: } 10.5 \\ \underline{1.5} \phantom{0} \\ 1.5 \overline{) 10.5} \\ \underline{10} \phantom{5} \\ 5 \\ \underline{5} \\ 0 \end{array}$$

\* Mixed Numbers must be converted to an improper fraction first in multiplication and division

$$\text{Ex: } 3 \frac{3}{5} = \frac{18}{5}$$

$$3 \frac{3}{5} \times 1 \frac{1}{4} \rightarrow \frac{18}{5} \times \frac{5}{4} = \frac{9}{2} = 4 \frac{1}{2}$$