<u>Fractions Review</u>

<u>Equivalent fractions</u>: we can obtain an equivalent fraction by multiplying or dividing both the numerator AND the denominator by the same value.

Ex. $\frac{15}{21}\,\frac{\div 3}{\div 3} = \frac{5}{7}$ $\qquad \frac{2}{3}\,\frac{\times 7}{\times 7} = \frac{14}{21}$

<u>Mixed numbers, improper fractions and decimals</u>: a fraction is improper when its numerator is greater than its denominator. Its value is thus greater than 1 and can be written as a mixed number.

Ex. $\frac{9}{7} = 1\,{}^{2}/_{7}$

improper

mixed number

numerator

denominator

- changing a mixed number to an improper fraction

ex// $3\,{}^{5}/_{6} = \frac{3}{1}\frac{\times 6}{\times 6} + \frac{5}{6} = \frac{(3\times 6)+5}{6} = \frac{23}{6}$

- changing an improper fraction to a mixed number

ex// $\frac{17}{3}$ ⇝ how many times does 3 fit into 17 . . . 5 times

$\therefore \frac{17}{3} = 5\frac{?}{3} = 5\,{}^{2}/_{3}$

- when you change a fraction (exact value) into a decimal, you often get an _approximation_ value. If you need an exact value, keep the fraction answer. Many calculators will will change a decimal answer into a fraction for you.

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Adding and Subtracting: we need a _common denominator_.

Ex. $\frac{1^{\times 3}}{4_{\times 3}} + \frac{2^{\times 4}}{3_{\times 4}}$

$= \frac{3}{12} + \frac{8}{12}$

$= \frac{11}{12}$

$2\frac{5}{7} + 4\frac{3}{5}$

$= \frac{19^{\times 5}}{7_{\times 5}} + \frac{23^{\times 7}}{5_{\times 7}}$

$= \frac{95}{35} + \frac{161}{35} = \frac{256}{35}$

NB always change to improper

Mutiplying: we ***do not*** need a _common denom._

Ex. $\frac{2}{3} \times \frac{4}{5}$

$= \frac{2 \times 4}{3 \times 5} = \frac{8}{15}$

$2/3 \times 1\,1/2$

$= \frac{11}{3} \times \frac{3}{2} = \frac{\cancel{33}^{11}}{\cancel{6}_{2}} = \frac{11}{2}$

* start with improper fraction

- simplifying first is always easier

Ex. $\frac{11}{3} \times \frac{3}{2} = \frac{11 \times 3}{3 \times 2} = \frac{3 \times 11}{3 \times 2} = \frac{\cancel{3}^{1}}{\cancel{3}_{1}} \times \frac{11}{2} = \frac{11}{2}$

ex// $\frac{\cancel{25}^{5}}{\cancel{7}_{1}} \times \frac{\cancel{49}^{7}}{\cancel{45}_{9}} = \frac{35}{9}$

ex// $\frac{\cancel{312}^{1}}{\cancel{25}_{5}} \times \frac{\cancel{5}^{1}}{\cancel{747}_{9}} \times \frac{\cancel{83}^{1}}{\cancel{624}_{2}}$

$= \frac{1 \times 1 \times 1}{5 \times 9 \times 2}$

$= \frac{1}{90}$

<u>Dividing</u>: instead of dividing, we can always multiply by the reciprocal.

- Recall:
  - > the reciprocal of $\frac{2}{3}$ is $\frac{3}{2}$
  - > the reciprocal of $\frac{2}{1}$ is $\frac{1}{2}$
  - > the reciprocal of $\frac{-5}{1}$ is $\frac{1}{-5} = \frac{-1}{5} = -\frac{1}{5} = -0.2$
  - > the reciprocal of $\frac{-1}{3}$ is -3

Ex. $\dfrac{\frac{2}{3}}{\frac{1}{2}} = \frac{2}{3} \div \frac{1}{2}$

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

$= \frac{4}{3}$

ex// $4\frac{3}{4} \div 1\frac{1}{3}$

improper fractions first

$= \frac{19}{4} \div \frac{4}{3}$

$= \frac{19}{4} \times \frac{3}{4}$

$= \frac{57}{16}$