Fractions Review

Equivalent fractions: we can obtain an equivalent fraction by multiply or divide both the numerator AND the denominator by the same value.

Ex. $\frac{15}{21} \overset{\times 2}{=} \frac{30}{42}$ or $\frac{15}{21} \overset{\div 3}{=} \frac{5}{7}$

Mixed numbers, improper fractions and decimals: 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. improper $\frac{9}{7} = 1\frac{2}{7}$ mixed number

numerator: 9 — denominator: 7

- changing a mixed number to an improper fraction

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

$4\frac{9}{5} = \frac{29}{5}$

- changing an improper fraction to a mixed number

ex// $\frac{17}{3} \rightsquigarrow 17 \div 3 = 5.\overline{6}$ (5 wholes)

$\therefore 5\frac{?}{3} \Rightarrow 5\frac{2}{3}$

$\frac{1}{9} = 0.\overline{1}$

$\frac{2}{9} = 0.\overline{2}$

$\frac{3}{9} = \frac{1}{3} = 0.\overline{3}$

$\frac{31}{99} = 0.\overline{31}$

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

Ti-83 ⇒ Math, enter, enter

A b/c ← fraction button

Adding and Subtracting: we need a common denominator.

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

$= \frac{15}{20} + \frac{8}{20}$

$= \frac{23}{20}$

$\frac{3}{8} + 1\frac{7}{12}$

$= \frac{3}{8}\times\frac{3}{3} + \frac{19}{12}\times\frac{2}{2}$

$= \frac{9}{24} + \frac{38}{24}$

$= \frac{47}{24}$

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

$= \frac{16}{5}\times\frac{7}{7} - \frac{10}{7}\times\frac{5}{5}$

$= \frac{112}{35} - \frac{50}{35}$

$= \frac{62}{35}$

Mutiplying: we ***do not*** need a common denominator.

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

$= \frac{3\times1}{5\times2} = \frac{3}{10}$

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

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

- simplifying first is always easier

Ex. $\frac{1}{4}\times\frac{4}{3} = \frac{1\times4}{4\times3} = \frac{4\times1}{4\times3} = \frac{\cancel{4}^{1}}{\cancel{4}_{1}}\times\frac{1}{3} = \frac{1}{3}$

ex// $\frac{\cancel{21}^{3}}{\cancel{10}_{2}}\times\frac{\cancel{8}^{1}}{\cancel{7}_{1}} = \frac{3\times1}{2\times1} = \frac{3}{2}$

ex// $\frac{\cancel{35}^{7}}{\cancel{164}}\times\frac{\cancel{4}^{1}}{\cancel{9}_{1}}\times\frac{\cancel{27}^{3}}{\cancel{55}_{11}} = \frac{21}{44}$

Dividing: instead of dividing, we can always multiply by the reciprocal.

- Recall:
  - > the reciprocal of $\frac{2}{3}$ is $\frac{3}{2}$
  - > the reciprocal of $\frac{4}{1}$ is $\frac{1}{4}$
  - > the reciprocal of $\frac{-5}{1}$ is $\frac{1}{-5} = \frac{-1}{5} = -\frac{1}{5} = -0.2$
  - > the reciprocal of $\frac{-5}{-7}$ is $\frac{-7}{-5} = \frac{7}{5}$

$\frac{1}{5} \times 2 = \frac{2}{10} = 0.2$

Ex. $\frac{\frac{2}{3}}{\frac{5}{7}} = \frac{2}{3} \div \frac{5}{7}$

$= \frac{2}{3} \times \frac{7}{5}$

$= \frac{14}{15}$

ex// $\frac{\frac{1}{3}}{5} = \frac{1}{3} \div 5$

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

$= \frac{1}{15}$