

Equivalent Fractions

- value stays the same, make them larger (by multiplying to get common denominators), or make them smaller (cross cancelling when multiplying or reducing final answer)

ex: $\frac{5}{10} \xrightarrow[\times 2]{\times 2} \frac{10}{20}$ $\frac{5 \div 5}{10 \div 5} \rightarrow \frac{1}{2}$

$\frac{3}{4} \xrightarrow[\times 3]{\times 3} \frac{9}{12}$ $-\left(-\frac{2}{3}\right) \rightarrow \frac{2}{3}$
 double Negative

Conversions

1. Proper into Improper:

Multiply denominator to whole number in front, Add that to numerator.

$2\frac{3}{4} = \frac{11}{4}$ $3\frac{2}{7} = \frac{23}{7}$ $-5\frac{1}{2} = -\frac{11}{2}$

2. Improper to Proper:

- If numerator is Larger than denom.
- Q: How many times can I remove my denominator from the numerator? That amount is our whole number. Subtract it from numerator.

ex: $\frac{8^{-6}}{3} = 2\frac{2}{3}$ $\frac{17^{-12}}{12} = 1\frac{5}{12}$ $\frac{45^{-40}}{8} = 5\frac{5}{8}$ $\frac{-116^{-80}}{40} = -2\frac{36 \div 2}{40 \div 2} = -2\frac{18 \div 2}{20 \div 2} = -2\frac{9}{10}$
 put negative on whole number

Multiplying Fractions

- Steps: 1 - Convert to Improper
 2 - Mult: Num x Num.
 3 - Mult: Den x Den.
 4 - Reduce and/or Convert

★ Cross Cancel if Possible

1. $\frac{2}{3} \times \left(-\frac{5}{6}\right) = -\frac{5}{9}$
 $\frac{2}{3} \times \left(-\frac{5}{6}\right) = -\frac{5}{9}$

2. $-5\frac{1}{2} \times \frac{3}{10} = -\frac{11}{2} \times \frac{3}{10} = -\frac{33}{20} = -2\frac{13}{20}$

3. $\frac{8}{2} \times \frac{3}{1} = \frac{1}{1}$ 4. $\frac{-18}{4} \times \frac{15}{1} = -\frac{9}{1} = -9\frac{1}{1}$

$$3. \frac{8^1}{3^1} \times \frac{3^1}{16^2} = \frac{1}{6}$$

$$4. \frac{-18^3}{4^20} \times \frac{15^3}{6^1} = \frac{-9}{4} = -2\frac{1}{4}$$

Dividing Fractions

- Steps:
- 1 - Convert to Improper
 - 2 - FLIP 2nd Frac, Change \div to \times
 - 3 - NUM \times NUM
 - 4 - DENO \times DENO.
 - 5 - Reduce and or Convert
- Cross Cancel if you can.*

$$1. \frac{1}{2} \div \frac{3}{9} = \frac{1}{2} \times \frac{9}{3} = \frac{9}{2} = 4\frac{1}{2}$$

$$2. 3\frac{1}{2} \div \frac{4}{1} = \frac{7}{2} \times \frac{1}{4} = \frac{7}{8}$$

⊛ Put a 1 under whole Number.

Adding & Subtracting

- Steps:
- 1 - Convert to Improper
 - ⊛ 2 - Make a Common Deno. Use LCM
 - 3 - Add or Subtract NUM only.
 - 4 - Reduce and or Convert

⊛ Cannot Cross Cancel ⊛

$$1. \frac{-2 \times 3}{5 \times 3} + \left(-\frac{1}{3}\right) \times 5$$

$$\frac{-6}{15} + \frac{-5}{15} = \frac{-11}{15}$$

$$2. -1\frac{1}{6} - \left(-\frac{2}{9}\right)$$

$$-\frac{7}{6} + \frac{2}{9} = \frac{-21}{18} + \frac{4}{18} = \frac{-17}{18}$$

Complete "Show You Know"

4 Q's p 65
1 Q p 66