Accelerated Math Notes
(Section 3.3)
Multiplying Rational Numbers

To multiply fractions and mixed numbers:

* make sure all numbers are written in fraction form.

$4\frac{2}{5} = \frac{22}{5}$ $\quad 12 = \frac{12}{1}$ $\quad -6 = \frac{-6}{1}$

* give yourself plenty of room above and below the problem
* look for common factors to simplify fractions $\frac{\cancel{26}^{2}}{7} \cdot \frac{11}{\cancel{15}_{5}} = \frac{4}{5}$
* multiply numbers in numerator
* multiply numbers in denominator
* Check to be sure answer is in simplest form

like signs → pos unlike → neg

Examples:

$-\frac{1}{2} \cdot 4\frac{2}{5}$

$\frac{-1}{\cancel{2}_{1}} \cdot \frac{\overset{11}{\cancel{22}}}{5}$

$\frac{-11}{5}$

$-2\frac{1}{5}$

$\left(-1\frac{7}{8}\right)\left(-2\frac{2}{5}\right)$

$\frac{-3}{\cancel{15}_{8}} \cdot \frac{-3}{\cancel{-12}_{5}}$

$\frac{9}{2}$

$4\frac{1}{2}$

$-36\left(1\frac{2}{3}\right)$

$\frac{\overset{-12}{\cancel{-36}}}{1} \cdot \frac{5}{\cancel{3}_{1}}$

-60

Application Problems that involve multiplying rational numbers

Three-fifths of LMS students ride the bus. If there are 350 LMS students, how many ride the bus?

part of something $\frac{3}{5}$ of students

$\frac{3}{\cancel{5}_{1}} \cdot \frac{\overset{70}{\cancel{350}}}{1}$ 210 students

Each day Sue practices piano $1\frac{1}{2}$ times as much as Meg who practices $\frac{3}{4}$ hour each day. How many hours does Sue practice each day?

$1\frac{1}{2} \cdot \frac{3}{4}$

$\frac{3}{2} \cdot \frac{3}{4} = \frac{9}{8}$ $1\frac{1}{8}$ hours

Evaluate if $a = \frac{3}{4}$ $\quad b = -4\frac{1}{2}$ $\quad c = -\frac{2}{9}$

abc^2

$\left(\frac{3}{4}\right)\left(-4\frac{1}{2}\right)\left(-\frac{2}{9}\right)^2$

$\frac{\overset{1}{\cancel{3}}}{\cancel{4}_{1}} \cdot \frac{\overset{-1}{\cancel{-9}}}{\cancel{2}_{1}} \cdot \frac{\overset{1}{\cancel{4}}}{\cancel{81}_{9}}$

$\frac{-1}{6}$

$b(ac)^2$

$\left(-4\frac{1}{2}\right)\left(\frac{\overset{1}{\cancel{3}}}{\cancel{4}_{2}} \cdot \frac{\overset{-1}{\cancel{-2}}}{\cancel{4}_{3}}\right)^2$

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

$\frac{\overset{-1}{\cancel{-9}}}{2} \cdot \frac{1}{\cancel{36}_{4}}$

$-\frac{1}{0}$