Multiplying and Dividing Fractions

**Multiplying**

* *What you know:* $\frac{3}{7}$ · $\frac{5}{2}$ = $\frac{15}{14}$
* *What you want to find out:*
	+ What do you notice about the equation? How did we get the new numerator and denominator?

**Rules for Multiplying**

$\frac{3}{7}\frac{·5}{·2}$ = $\frac{15}{14}$

1. Multiply the numerators together. The answer is the new numerator.
2. Multiply the denominators together. The answer is the new denominator.

**Dividing**

* *What you know:* $\frac{3}{7}$ ÷ $\frac{5}{2}$ = $\frac{6}{35}$
* *What you want to find out:*
	+ What do you notice about the equation? How did we get the new numerator and denominator?

**Rules for Dividing**

$\frac{3}{7}÷\frac{5}{2}$ = $\frac{3}{7}·\frac{2}{5}=\frac{6}{35}$

1. Flip the second fraction (find it’s reciprocal)
2. Now multiply!

**Match the Fractions**

A.$  \frac{18}{28} $= $\frac{9}{14}$

B. $\frac{12}{36} $= $\frac{1}{3}$

C. $\frac{15}{48}$ = $\frac{5}{16}$

D. $\frac{27}{16}$

1.$  \frac{3}{4} ∙\frac{4}{9}$

2. $\frac{3}{4}÷\frac{4}{9}$

3. $\frac{5}{8} ∙\frac{3}{6}$

4. $\frac{6}{4}÷\frac{7}{3}$

* Match the equations to their correct answer

**Negatives!!!**

* When multiplying negative fractions, use the same exact rules as multiplying integers
* What do you notice about these equations?

$\frac{-3}{6}∙$ $\frac{4}{9}$ = $\frac{-12}{54}$ $\frac{3}{6}∙$ $\frac{4}{-9}$ = $\frac{-12}{54}$ $-$ $\frac{3}{6}∙$ $\frac{4}{9}$ = $\frac{-12}{54}$

* When multiplying a negative and positive fraction, the answer is always negative
* What do you notice about these equations?

$\frac{-3}{6}∙$ $-\frac{4}{9}$ = $\frac{12}{54}$ $\frac{-3}{6}∙$ $\frac{4}{-9}$ = $\frac{12}{54}$ $-$ $\frac{3}{6}∙$ $\frac{4}{-9}$ = $\frac{12}{54}$

* When multiplying two negative fractions, the answer will always be positive.

**Dividing Negatives**

* When dividing negative fractions, use the same exact rules as dividing integers
* What do you notice about these equations?

$\frac{-3}{6}÷$ $\frac{4}{9}$ = $\frac{-27}{24}$ $\frac{3}{6}÷$ $\frac{4}{-9}$ = $\frac{-27}{24}$ $-$ $\frac{3}{6}÷$ $\frac{4}{9}$ = $\frac{-27}{24}$

* When dividing a negative and positive fraction, the answer is always negative
* What do you notice about these equations?

$\frac{-3}{6}÷$ $-\frac{4}{9}$ = $\frac{12}{54}$ $\frac{-3}{6}÷\frac{4}{-9}$ = $\frac{12}{54}$ $-$ $\frac{3}{6}÷\frac{4}{-9}$ = $\frac{12}{54}$

* When dividing two negative fractions, the answer will always be positive.

**Mixed Numbers**

* When multiplying and dividing with fractions containing mixed numbers, *first change the mixed number into an improper fraction*

4$\frac{3}{5}=\frac{23}{5}$

**Quick Practice-** Solve the equations. CHECK YOUR SIGNS!

1.$  \frac{-7}{3} ∙\frac{8}{9}$

2. $\frac{10}{4}÷-4\frac{5}{9}$

3. $\frac{-3}{5} ∙11$

4. $-\frac{12}{8}÷\frac{-9}{1}$

**Multiplication Word Problem**

 1. Ariel’s English hw is to read 24 pages. She reads 1/8 of the pages on the bus. How many pages did she read?

**Division Word Problem**

 2. Joey has 12 ½ yards of material. A cape for a play takes $3\frac{5}{6}$ yards. How many capes can Joey make?