



## SEMINAR NOTES

### Learning Guide 6

A diagram on a spiral notebook page showing the multiplication of two fractions and their simplification. The first part shows  $\frac{1}{2} \times \frac{20}{18} = \frac{20}{36}$ . Red arrows point from the 1 to the 20 and from the 2 to the 18. Below this, it says "GCF: 4". The second part shows  $\frac{20}{36} \div 4 = \frac{5}{9}$ . The numbers 5 and 9 in the simplified fraction are enclosed in a red box.

A mnemonic card for dividing fractions. It features a cartoon Chewbacca character wearing a black cap and sunglasses, holding a blaster. The text on the card reads: "Keep Chewbacca Fly", "When dividing fractions, always remember to:", "Keep: Keep the first number/fraction the same", "Change: Change the division sign to multiplication", and "Flip: Flip the second number/fraction". The card has a decorative border with orange and black polka dots and "XXXX" at the top and bottom corners.

## Multiplying Basic Fractions

When multiplying basic fractions look to cross cancel before multiplying to make the multiplication easier.

**Ex.**

Find the product of the following fractions.

Cross cancel,  
if possible.

$$\frac{\overset{3}{\cancel{6}}}{\underset{5}{\cancel{10}}} \times \frac{\overset{2}{\cancel{4}}}{\underset{7}{\cancel{14}}} = \frac{3}{5} \times \frac{2}{7} = \frac{6}{35}$$

Multiply the numerators,  
multiply the denominators.

Rewrite after  
canceling.

SIMPLIFY BEFORE  
YOU MULTIPLY

**Try**

$$\frac{11}{5} \times \frac{25}{77}$$

Find the product each of the following:

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

$$\left(\frac{-3}{4}\right) \times \left(\frac{2}{5}\right) =$$

$$\left(\frac{6}{7}\right) \times \left(-\frac{14}{3}\right) =$$

$$\left(\frac{-1}{12}\right) \times \left(\frac{9}{-4}\right) =$$

## Multiplying Rational Numbers

When multiplying rational numbers, change mixed numbers to improper fractions first, cross cancel, then multiply across the numerators and denominators.

**Ex.** Find the product of the following fractions.

$$\left(-2\frac{1}{2}\right) \times \left(1\frac{3}{10}\right) = \frac{-5}{2} \times \frac{13}{10} = \frac{-13}{4}$$

Change to a mixed number.  $= -3\frac{1}{4}$   
*Optional*

Change to improper fractions.

Cross cancel, if possible.

Decide on the sign using the even & odd rule.

Multiply the numerators, multiply the denominators.

**Try**

$$-3\frac{1}{5} \times 2\frac{1}{12}$$

Find the product each of the following:

$$1\frac{2}{5} \times 2\frac{2}{3} =$$

$$\left(-1\frac{1}{4}\right) \times \left(3\frac{2}{5}\right) =$$

$$\left(-4\frac{6}{7}\right) \times \left(-\frac{14}{17}\right) =$$

## Dividing Basic Fractions

When dividing basic fractions it is best to multiply by the reciprocal, then follow the rules for multiplying fractions.

**Ex.** Find the quotient of the following fractions.

$$\frac{6}{10} \div \frac{14}{4} = \frac{\overset{3}{\cancel{6}}}{\underset{5}{\cancel{10}}} \times \frac{\overset{2}{\cancel{4}}}{\underset{7}{\cancel{14}}} = \frac{\overset{3}{\cancel{2}} \times \overset{2}{\cancel{2}}}{\underset{5}{\cancel{2}} \times \underset{7}{\cancel{7}}} = \frac{6}{35}$$

Multiply the numerators,  
multiply the denominators.

Multiply by  
the reciprocal.

Cross cancel,  
if possible.

Rewrite after  
canceling.

**Try**

$$\frac{24}{20} \div \frac{15}{35}$$

Find the quotient of the following:

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

$$\left(\frac{-5}{4}\right) \div \left(\frac{1}{8}\right) =$$

$$\left(\frac{3}{8}\right) \div \left(-\frac{9}{4}\right) =$$

$$\left(\frac{2}{-3}\right) \div \left(\frac{-6}{7}\right) =$$

## Dividing Rational Numbers

When dividing fractions, change to multiplication and write the reciprocal of the second fraction. Use the even & odd rule to find the sign of the answer.

**Ex.** Find the quotient of the following fractions.

$$\left(-2\frac{1}{3}\right) \div \left(-3\frac{1}{2}\right) = \left(\frac{-7}{3}\right) \div \left(\frac{-7}{2}\right)$$

Multiply by the reciprocal.

Change to improper fractions.

$$= \left(\frac{-7}{3}\right) \times \left(\frac{-2}{7}\right)$$

Cross cancel.

Rewrite fractions and multiply numerators & denominators

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

Use the even & odd rule to find the sign of the answer.

**Try**

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

Find the quotient of the following:

$$2\frac{2}{5} \div \left(-1\frac{2}{3}\right) =$$

$$\left(-1\frac{1}{4}\right) \div \left(3\frac{2}{5}\right) =$$

$$\left(-2\frac{5}{6}\right) \div \left(-3\frac{1}{4}\right) =$$

**Try**

Use BEDMAS to simplify the following:

$$\frac{4}{5} - \left(\frac{2}{3}\right)\left(\frac{3}{10}\right) =$$

$$\left(\frac{-1}{4}\right) \div \left(\frac{3}{8}\right) + \left(\frac{1}{2}\right) =$$

$$\left(\frac{5}{6} + \frac{2}{3}\right) \div \left(-\frac{1}{4}\right) =$$

Use BEDMAS to simplify the following:

$$\left(\frac{-2}{3}\right) \div \left(\frac{3}{4}\right) + \left(\frac{1}{3}\right)\left(\frac{1}{3}\right)\left(\frac{1}{2}\right) =$$

$$\left(\frac{-2}{3}\right) \div \left[\left(\frac{3}{4}\right) + \left(\frac{1}{3}\right)\right]\left(\frac{1}{3}\right)\left(\frac{1}{2}\right) =$$

Use BEDMAS to simplify the following:

$$\left(-1\frac{1}{2}\right) + \left(\frac{-2}{3}\right)\left(2\frac{3}{4}\right) =$$

$$\left(-2\frac{1}{4}\right) \div \left(1\frac{3}{8}\right) + \left(2\frac{1}{2}\right) =$$

$$\left(\frac{5}{6} + 2\frac{2}{3}\right) \div \left(-1\frac{3}{4}\right) =$$

Use the formula  $SA = 2\pi r^2 + 2\pi rh$  to find the surface area of the following can:

