

## MATH 1010 Fraction Activity

In Chapter Six, we'll be working with rational expressions. It will be helpful to keep in mind all the rules you already know for working with fractions (rational numbers). Below each operation is a link to a tutorial to remind you of how to perform the operation. If you do not feel like you are an expert at working with fractions, please look at the material at each link.

### Adding Fractions

[http://www.mathsisfun.com/fractions\\_addition.html](http://www.mathsisfun.com/fractions_addition.html)

$$\frac{2}{3} + \frac{1}{8} =$$

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

$$\frac{2}{3x} + \frac{1}{8x} =$$

$$\frac{3}{2x} + \frac{2}{3x} =$$

### Subtracting Fractions

[http://www.mathsisfun.com/fractions\\_subtraction.html](http://www.mathsisfun.com/fractions_subtraction.html)

$$\frac{1}{3} - \frac{2}{9} =$$

$$\frac{5}{6} - \frac{1}{8} =$$

$$\frac{1}{3x} - \frac{2}{9x} =$$

$$\frac{5}{x} - \frac{1}{y} =$$

### Multiplying Fractions

[http://www.mathsisfun.com/fractions\\_multiplication.html](http://www.mathsisfun.com/fractions_multiplication.html) This site does not show you the “shortcut” to make your life easier when multiplying fractions (this saves you from reducing at the end, but is equivalent to doing it the way shown at the website). Before multiplying you can reduce any common factors in the numerator and

denominator so  $\frac{1}{2} \cdot \frac{2}{5}$  could first be reduced by the common factor of 2 before multiply:  $\frac{1}{\cancel{2}} \cdot \frac{\cancel{2}}{5} = \frac{1}{5}$

$$\frac{2}{3} \cdot \frac{1}{8} =$$

$$\frac{1}{3} \cdot \frac{9}{2} =$$

$$\frac{2}{3x} \cdot \frac{9x}{5} =$$

## Dividing Fractions

[http://www.mathsisfun.com/fractions\\_division.html](http://www.mathsisfun.com/fractions_division.html)

$$\frac{1}{3} \div \frac{2}{9} =$$

$$\frac{5}{6} \div \frac{1}{8} =$$

$$\frac{1}{3x} \div \frac{2}{9x} =$$

$$\frac{5x}{6} \div \frac{1}{8x} =$$

## Practice with Fractions

Find which answer is equivalent for the following problems:

1.  $\frac{3+6 \cdot 4}{3} =$

a.  $3 + \frac{6 \cdot 4}{3}$

b.  $\frac{3}{3} + 6 \cdot 4$

c.  $\frac{3}{3} + \frac{6 \cdot 4}{3}$

d.  $\frac{3}{3} + \frac{6}{3} \cdot \frac{4}{3}$

2.  $\frac{4}{3} + \frac{8}{3} =$

a.  $\frac{12}{6}$

b.  $\frac{12}{3}$

c.  $4 \cdot 3 + 8 \cdot 3$

d.  $\frac{4 \cdot 8}{3 \cdot 3}$

3.  $10 + \frac{7}{5} =$

a.  $\frac{17}{5}$

b.  $10\frac{7}{5}$

c.  $\frac{50}{5} + \frac{7}{5}$

d.  $\frac{10+7}{1+5}$

Check with your lab buddy to be sure you agree on these.

## Checking Solutions

One of the great things about factoring problems is that you can check your factorization by multiplying the factors back together.

1. Check to see if the given factorization is correct by multiplying it out.

$$a^2 + 2ab + b^2 - 1 = (a + b + 1)(a + b - 1)$$

We can do a similar process when dividing or simplifying rational functions. Say we divide  $36x - 24$  by 4 and get  $9x - 6$ . To check if  $\frac{36x - 24}{4}$  and  $9x - 6$  are the same, we use multiplication. If  $36x - 24$  divided by 4 is  $9x - 6$ , then  $9x - 6$  times 4 should be  $36x - 24$ .

$$4(9x - 6) = 4 \cdot 9x - 4 \cdot 6 = 36x - 24$$

2. Use multiplication to determine if  $\frac{12x - 4}{4}$  and  $3x - 1$  are the same.

3. Use multiplication to determine if  $\frac{6x^2 + 19x + 10}{2x + 5}$  and  $3x + 2$  are the same.

4. Use multiplication to determine if  $\frac{50x^2 - 25x - 7}{5x + 1}$  and  $10x - 7$  are the same.

## Spot the Error

Work with your lab buddy to discuss the following three problems

1. Felicia was asked to add the fractions  $\frac{4}{3} + \frac{8}{3}$ . She wrote  $\frac{4}{3} + \frac{8}{3} = \frac{12}{6} = 2$ . Explain what Felicia did wrong, using complete sentences.
  
2. Carl was asked to simplify the expression  $\frac{4-8x}{8}$ . He wrote down  $4-x$  as his answer. Explain what Carl did wrong, using complete sentences.
  
3. Keiko was asked to add the fractions  $\frac{x}{3} + \frac{x}{9}$ . She wrote down  $\frac{x}{12}$  as her answer. Explain what Keiko did wrong, using complete sentences.

## GAME TIME

You've spent a lot of time working on factoring and you'll need to be really good at that in order to be successful in working with rational equations, so let's get some more practice.

Go to <http://www.quia.com/rr/36611.html> and play the Rags to Riches game. Help your lab buddy with the factoring and see who can win the most money! Play at least one round, more if you like.

Here is the link for the class competition when your instructor when your instructor tells you it is time.  
<http://www.math-play.com/Fractions-Jeopardy/fractions-jeopardy.html>