4.3 Basic Rules of Algebra

Algebraic manipulation can be quite fun (seriously…I'm not kidding…don't make fun of me…that's mean), **but care must be taken to properly apply the basic rules of algebra**. And so, I hope you will learn the rules well.
I'm allowing one (or maybe two) period(s) for the following assignment.

Basics of Algebra Assignment

Part A (*but not likely done first*)

Following is **a** Solution to a Rational Equation, written by your Advanced Functions teacher. In each line, one or more of the Basic Rules of Algebra is used. For each line of the solution, state the name of the rule(s) used. Every rule used needs to be stated. You may find the solution contains rules not defined in the assigned reading. Seek to learn any rules you may suspect are needed. For example, the distributive rule may be used (or perhaps the "double distributive rule").

The Distributive Rule (or Property):

Rule: Given real numbers m, a, and b, then $m(a+b)=ma+mb$.

Explanation: The operation of "$m\times$" is distributed over the operation of "+"

Example: $2(x-3y)=2x-2(3y)=2x-6y$

The Given Solution (but is it the "only" path to the solution?)

$\frac{10}{x(x-2)}+\frac{4}{x}=\frac{5}{x-2}$, restrictions $x\neq 0,2$

$\Rightarrow (x(x-2))\left[\frac{10}{x(x-2)}+\frac{4}{x}\right]=(x(x-2))\left[\frac{5}{x-2}\right]$

$\Rightarrow 10+(x-2)(4)=x(5)$

$\Rightarrow 10+4x-8=5x$

$\Rightarrow 4x+10-8=5x$

$\Rightarrow 4x-5x=-2$

$\Rightarrow -x=-2$

$\Rightarrow x=2$, BUT $x\neq 2$ by the restrictions

$\therefore$ No Solutions

Part B (*but likely done first*)

You have pages 87 and 88 to write good notes based on reading the page found at: **http://www.themathpage.com/alg/rules-of-algebra.htm.**

I will read your notes. I am looking for an understanding of the rules you learn about. You'll need to communicate to me that you understand those rules. How you do that, I leave to you. *Please ask for help if you feel the need. Look at how I communicated The Distributive Rule on page 85 as an example. I will start you off with the first rule, but you don't have to use my style. If you need more paper, staple it to the end of this booklet*.

Don't simply rewrite the words and examples you find at "themathpage". Write in your own words, and your own style. Examples are a good thing, by the way. Note that the page I have requested you read has some hyperlinks to related topics. Follow them if you wish, but remember to finish the assignment.

Finishing the Assignment requires (15 marks given – 10 C and 5 K):

1) Writing comprehensive notes demonstrating understanding of the Rules of Algebra. Your notes should be based on what you read at http://www.themathpage.com/alg/rules-of-algebra.htm.
2) Providing a list of Basic Rules of Algebra used in the solution given in Part A of the assignment. How you communicate those rules to me is left to you, but you may find it simplest to write your list of rules used beside the appropriate lines of the solution on page 85.

Finishing the Assignment does not require (but would be welcome if you are willing to participate) answers to some or all of the following (no marks given):

1) Answering all or some of the following:
    A. Describe what you liked and/or disliked about working through this lesson.
    B. Did you enjoy the style of teaching done through the suggested webpage? If yes, why? If no, why?
    C. What can I do, as your teacher, to teach your Advanced Functions class better?
2) Are you willing to allow your answers to questions A. and B. above to be read by the teacher who wrote the "Rules of Algebra" page? A simple yes or no is enough for me. If yes, your comments may be included in a document to be sent to the author. If no, your comments are not to be included.

You may answer the non-required questions on pages 87 or 88, or in an electronic document.

Remember to ask for help. Ask for help from me, and from your classmates. Be willing to help if asked. **In the end, make sure you learn the material**. Don't just copy someone's work, and don't let anyone copy your work.

Notes on some Basic Rules of Algebra

The Rule of Symmetry

Rule: Given two real numbers (or two mathematical objects) a and b,
if $a = b$, then $b = a$.

Explanation / Use: (Use) You can turn equations around.

Example: If $0 = x^2 + 5x - 6$ then we can write $x^2 + 5x - 6 = 0$.

The Commutative Rules

For Addition

Rule: