Lesson RF - 1

ABBUBACA.COM QR

Objective: Simplifying Rational Expressions

Homework RF-1 – NYA p.674 #1, 2, 5, 9, 10, 11, 14, 17, 19, 34, 48

Do Now: Name any domain restrictions 1. $y = \frac{2}{x}$ 2. $y = \frac{1}{3x - 15}$

Exam Prep: Which equation represents an exponential function?

a) $y = x^2 - 1$ b) $y = 6x$ c) $y = 3^x$ d) $y = 5$

Rational Functions look ugly but they have an inner beauty.
Here there is nothing new again… just a lot of stuff together.
My bowtie is quite lovely, isn't it?

To simplify a rational expression you will use several factoring techniques without violating any laws of Algebra. Explore all possibilities!

A rational expression is in simplest form if its numerator and denominator have no common factors.

Simplify		
$\frac{6x + 12}{x + 2}$	$\frac{6x + 12}{x + 2} \rightarrow \frac{6(x + 2)}{x + 2} \rightarrow \frac{6}{1}$ *or* 6	1. Factor 2. Cancel out common factors 3. Simplify or clean-up

Factoring Methods Review

GCF			Difference of Squares	Reverse FOIL
$6x^3 + 3x^2 - 15x$	or	$5x + 20$	$4x^2 - 9$	$x^2 + 2x - 15$
$3x(2x^2 + x - 5)$	or	$5(x + 4)$	$(2x + 3)(2x - 3)$	$(x + 5)(x - 3)$

Practice Set 1

1. $\frac{15b}{25b^2}$	2. $\frac{12c^2}{3c + 6}$	3. $\frac{4m - 2}{2m - 1}$	4. $\frac{20 + 4t}{t + 5}$	5. $\frac{10y^2 + 20y}{7y + 14}$

Note domain restrictions when the denominator can equal zero!

Practice Set 2

6.	$\frac{3x+12}{x^2-x-20}$	7.	$\frac{2z-2}{z^2-4z+3}$	8.	$\frac{8a+16}{2a^2+5a+2}$	9.	$\frac{c^2-c-6}{c^2+5c+6}$	10.	$\frac{y^2-2y+3}{4y^2-8y+12}$

Special Case	$\frac{x-3}{3-x} = -1$	$\frac{x-3}{3-x} \rightarrow \frac{x-3}{-1(x-3)} \rightarrow \frac{1}{-1}$ or -1
Example		$\frac{5x-15}{9-x^2} \rightarrow \frac{5(x-3)}{(3-x)(3+x)} \rightarrow \frac{5}{-1(3+x)} \rightarrow -\frac{5}{3+x}$ or $\frac{-5}{3+x}$

Practice Set 3

11.	$\frac{x+1}{1+x}$	12.	$\frac{x-4}{4-x}$	13.	$\frac{8-m}{m^2-64}$	14.	$\frac{8-4r}{r^2+2r-8}$	15.	$\frac{2c^2-2}{3-3c^2}$

The Doctor's Advice:

"Don't get set into one form, adapt it and build your own, and let it grow, be like water. Empty your mind, be formless, shapeless — like water. Now you put water in a cup, it becomes the cup; you put water into a bottle it becomes the bottle; you put it in a teapot it becomes the teapot. Water can flow or it can crash. Be water, my friend."

–Bruce Lee