Take a few minutes to get ready for our Chapter 8 (small) test. We will go over any questions you have after Mrs. Hansen takes roll.

*If you want to add anything to your 3x5 card, do that **now**! :)

Chapter 8 Test

-good luck!-

6-like

$$4\sum_{n=1}^{6} 2^n = 4(2^1+2^2+2^3+2^4+2^5+2^6)$$

$$=4\cdot 2^1+4\cdot 2^2+4\cdot 2^3+4\cdot 2^4+\cdots$$

$$S_6=\frac{4\cdot 2^6(2)-4\cdot 2^1}{2-1}$$

Jan 26-1:09 PM

4.2 All in the Family

A Develop Understanding Task

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We have studied several families of functions over the past few years including linear, exponential, quadratic, logarithmic, square root, and polynomials in general. In this task, we will examine features of families of functions from our previous work and also look at the features of the functions we call rational functions.

Part I: Finding features. Use the table to describe the process you would use to find a given feature based on the function and then write how this feature can be found for any function.

1.	The process I use to **find roots** for the following functions:	
Linear	Logarithmic	Polynomial (in factored form)
In general, you find the roots of a function by…		

2.	The process I use to determine **end behavior** for the following functions:	
Quadratic	Exponential	Polynomial
In general, you determine the end behavior of a function by…		

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3.	**Asymptotes** occur when…	
Logarithmic	Exponential	
In general, asymptotes of a function occur when… And you can determine asymptotes by…		

4.	The **Domain** of a function is…	
Square root	Logarithmic	Polynomial
In general, the domain of a function is…		

Jan 29-8:52 AM

Part II: Characteristics of Rational Functions

In Birthday Gift we saw a rational function used to model the situation with Chile. Rational Functions are any function $f(x)$ such that $f(x) = \frac{P(x)}{Q(x)}$ where P and Q are polynomials in x and Q is not the zero polynomial. In other words a rational function is a ratio between two polynomials.

Below are examples of rational functions. Like other functions we have studied, rational functions come in different forms, with each form highlighting different aspects of the function.

parent function

$f(x) = \frac{1}{x}$ $\quad f(x) = \frac{x}{x+3} + \frac{5}{x-2}$ $\quad f(x) = \frac{(x^2 + 5x - 1)}{(x^4 + 3x^2 - 6)}$ $\quad f(x) = \frac{((x-3)(x+1))}{(x(x-1)(x-4))}$

Based on other functions we have studied, make a conjecture as to how you would find the following features of a rational function.

5.

Conjecture as to how to determine each feature of a rational function:	Find the features of this function: $f(x) = \frac{(x-3)(x+1)}{x(x-1)(x-4)}$
To find roots...	Roots:
To determine end behavior...	End Behavior:
To find asymptotes...	Asymptotes:

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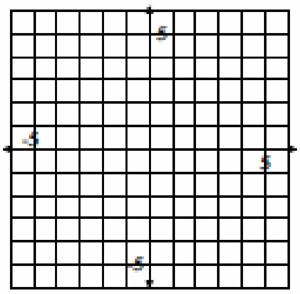
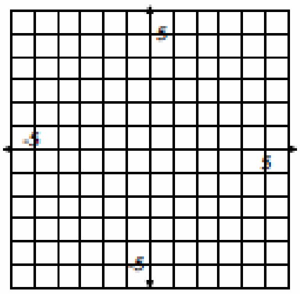
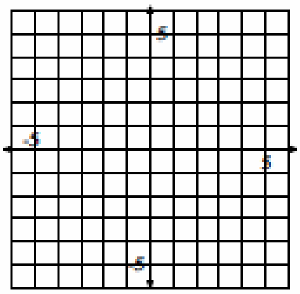
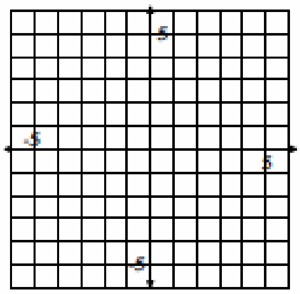
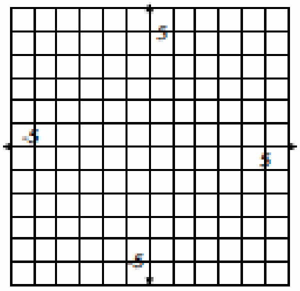
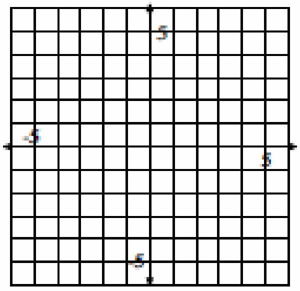
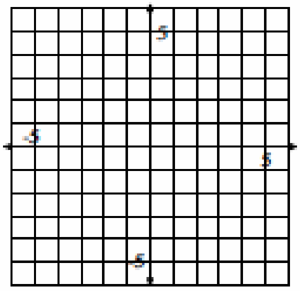
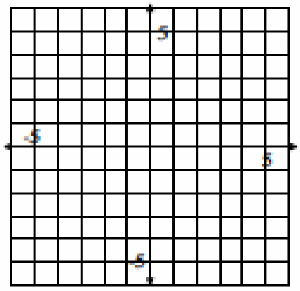
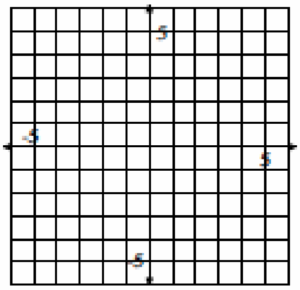
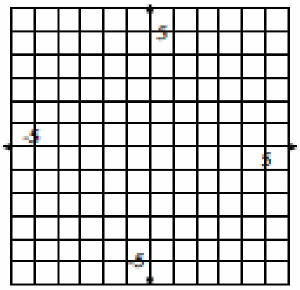
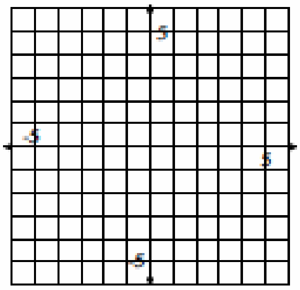
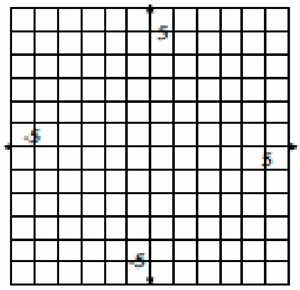
Part III: Parent Functions and transformations.

The linear, quadratic, square root, and rational parent function are below. Sketch a graph of the parent function and then sketch the graphs of "parents transformed". Use a table of values to assist you.

5. $f(x) = x$	6. $g(x) = x^2$	7. $h(x) = \sqrt{x}$	8. $p(x) = \frac{1}{x}$
			
$t(x) = f(x) + 3$	$t(x) = g(x) + 3$	$t(x) = h(x) + 3$	$t(x) = p(x) + 3$
			
$m(x) = f(x-2)$	$m(x) = f(x-2)$	$m(x) = f(x-2)$	$m(x) = f(x-2)$
			

9. Each function type has characteristics that separate it from other families of functions, yet there are also connections to be made across families. Summarize this task by explaining how you see rational functions as different from other functions you have studied as well as by how they are similar to all functions.

Homework/Classwork

Finish the "Ready, Set, Go" pages that you have been given, #1-15, and anything else you have **not** finished from the 4.2 worksheets. Whatever is not finished in class is homework!