ALGEBRA II

AND BEYOND…

About me…

- Bekki George
- Instructional Assistant Professor
- Department of Mathematics
- University of Houston
- Taught for 20 years in public high school prior to teaching at university level.
- Taught all levels of Math (basic skills through Calculus) and Computer Science

Main Topics Taught in Algebra 2

- Review of Algebra 1
- Equations and Inequalities
- Functions (including composite and piecewise)
- Polynomial and Rational Functions
- Exponential and Logarithmic Functions
- Systems of Equations and Inequalities
- Complex Numbers

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'PARENT FUNCTIONS'

- Linear $y = x$
- Quadratic $y = x^2$
- Square Root $y = \sqrt{x}$
- Cubic $y = x^3$
- Exponential $y = a^x$
- Logarithmic $y = log_a x$
- Rational $y = 1/x$

UNDERSTANDING GRAPHS=

UNDERSTANDING DOMAIN
UNDERSTANDING RANGE
FINDING ROOTS

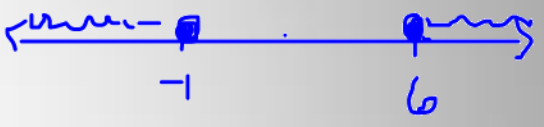
Determine the domain of the following:

$$f(x)=\frac{\sqrt{x^2-5x-6}}{x^2-25}$$

$\sqrt{x^2-5x-6}$

$x^2-5x-6 \geq 0$

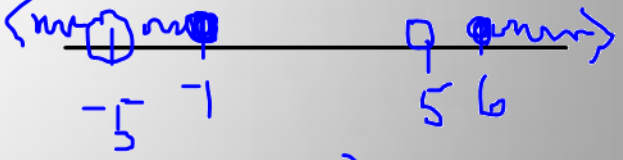
$(x-6)(x+1) \geq 0$



$x^2-25 \neq 0$

$(x-5)(x+5) \neq 0$

$x \neq 5, -5$



$(-\infty, -5) \cup (-5, -1] \cup [6, \infty)$

Use the function below to answer the question that follows.

$$f(x) = \frac{4}{x^2 - cx + 9}$$

When the rational function f given by the equation above is graphed in the xy-plane, what value of c will produce exactly one vertical asymptote?

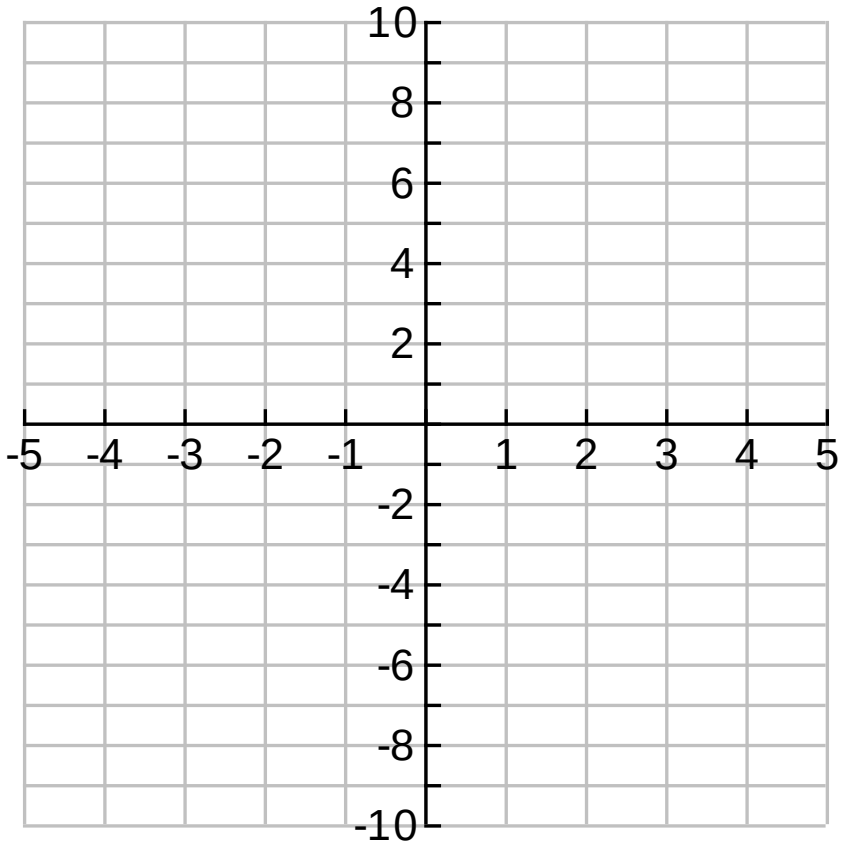
$b^2 - 4ac = 0 \Rightarrow$ one solution

$(-c)^2 - 4(1)(9) = 0$

$$y = \left(\frac{1}{3}\right)^{x-1}$$

$y = a^x$

$\frac{1}{3} = 3^{-1}$



a. growth or decay? _____
b. domain: _____
c. range: _____
d. asymptote: _____

Function	Transformation of the graph of $f(x)$
$f(x)+c$	Shift $f(x)$ upward c units
$f(x)-c$	Shift $f(x)$ downward c units
$f(x+c)$	Shift $f(x)$ to the left c units
$f(x-c)$	Shift $f(x)$ to the right c units
$-f(x)$	Reflect $f(x)$ in the x-axis
$f(-x)$	Reflect $f(x)$ in the y-axis
$a \cdot f(x)$, $a > 1$	Stretch $f(x)$ vertically by a factor of a. (This makes the graph 'taller'.)
$a \cdot f(x)$, $0 < a < 1$	Shrink $f(x)$ vertically by a factor of a. (This makes the graph 'shorter'.)

Describe how the graphs of each of the following functions can be obtained from the graph of $y = f(x)$.

$y = f(x)+1$

$y = f(x-7)$

$y = f(-x)+3$

$y = -f(x+3)-8$

$y = -\frac{1}{4} f(x-2)-5$

Resources

- My email: bekki@math.uh.edu
- My website: http://www.math.uh.edu/~bekki
- http://online.math.uh.edu/hsmath/
- Online Quizzes available! http://www.estudy.uh.edu
- Textbooks and videos http://online.math.uh.edu
- PDF Annotator: http://www.ograhl.com/en/pdfannotator/
- Graphing software:
  - Geogebra: http://www.geogebra.org
  - Winplot: http://math.exeter.edu/rparris/winplot.html