

Tuesday 2/11/2020

1. Grab Calc.
2. Finish warm-up (from Friday)
3. Unit 4 Quiz 2 Discussion
4. Rational Graph Notes
5. HW/Practice

S.W.B.A.T. find all of the characteristics of a rational function (VA, Holes, X-int, Y-Int & HA)

I.O.T. accurately graph a rational function.

Topic: Rational Graphs – All Characteristics

Name: _____

What am I learning today?

Date: _____

Warm-Up Find the following characteristics of the function. $\frac{b^2 + 3b - 28}{b^2 - 49}$

$\frac{(b+7)(b-4)}{(b+7)(b-7)} = (0, 1)$

H.A.	HOLES	V.A.	X-INT	Y-INT
$y = 1$ $y = 1$	$x + 7 = 0$ $x = -7$ $\frac{-7-4}{-7-7} = \frac{-11}{-14}$ $(-7, \frac{11}{14})$	$x - 7 = 0$ $x = 7$	$x - 4 = 0$ $x = 4$ $(4, 0)$	$\frac{0^2 + 3(0) - 28}{0^2 - 49} = \frac{-28}{-49}$ $(0, \frac{4}{7})$

Graphs of Rational Functions

To graph a rational function:

- Graph all characteristics.
- Construct a table of values using a calculator.
 - Start the middle value at the vertical asymptote
 - 2 values LESS THAN
 - 2 values GREATER THAN
- Plot all points from the table
- Sketch curves by connecting points. Curves will get closer and closer to the asymptotes.

Rational Functions and Asymptotes

Examples Find the following characteristics then graph the function: $f(x) = \frac{x^2 - 11x + 18}{x^2 + 2x - 8}$

num = den

H.A.: $y = 1$

Holes(s): $(2, -1.2)$
 $x - 2 = 0$ $x = 2$ $y = \frac{-7}{6}$

V.A.(s): $x + 4 = 0$ $x = -4$

x-int(s): $x - 9 = 0$ $x = 9$ $(9, 0)$

y-int: $(0, -2.25)$

x	y
-6	7.5
-5	14
-4	Error
-3	-12
-2	-5.5

$\frac{(x-9)(x+2)}{(x+4)(x-2)}$

Topic: Rational Graphs – All Characteristics

Date: _____

Examples

Find the following characteristics then graph the functions below:

$n < m < d < n$.

$$f(x) = \frac{x-1}{x^2+3x-10} = \frac{x-1}{(x+5)(x-2)}$$

H.A.: $y=0$

Holes(s): n/a
 n/m

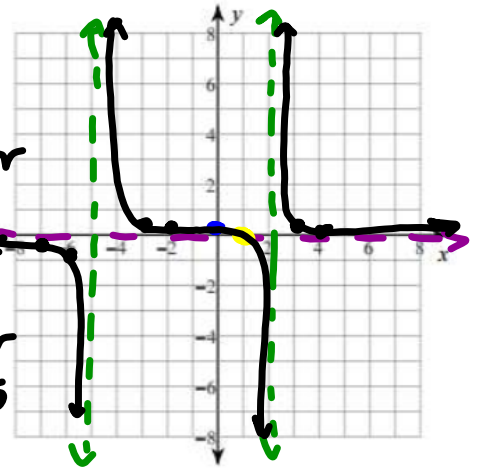
V.A.(s): $x+5=0 \Rightarrow x=-5$
 $x-2=0 \Rightarrow x=2$

x-int(s): $x-1=0 \Rightarrow x=1 \Rightarrow (1,0)$

y-int: $(0, 0.1)$

$$= \frac{0-1}{0^2+3(0)-10} = \frac{-1}{-10} = 0.1$$

X	Y
-7	-0.4
-6	-0.9
-5	Error
-3	0.4
-1	0.2
2	Error
3	0.25
4	0.2



You Try

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

H.A.: $y=1$

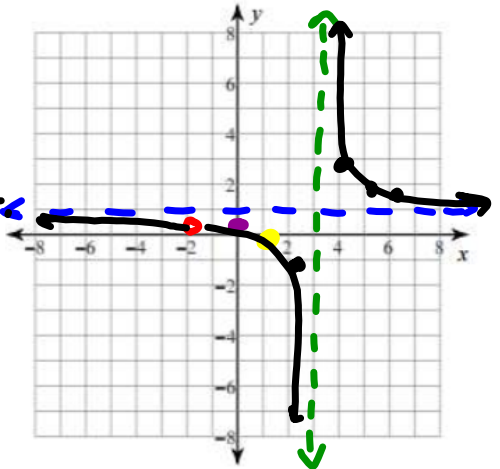
Holes(s): $x+2=0 \Rightarrow x=-2 \Rightarrow (-2, 1)$

V.A.(s): $x-3=0 \Rightarrow x=3$

x-int(s): $x-1=0 \Rightarrow x=1 \Rightarrow (1, 0)$

y-int: $(0, 3)$

X	Y
2	-1
3	Error
4	3
6	1.7



Summary

Summarize the lesson in your own words