

① Use homework tally as needed

② Warm Up

Factor

$$6x^2 - 21x + 9$$

$$3(\quad)$$

Hint

First factor out everything that is common!

$$6x^2 - 21x + 9$$

$$3(2x^2 - 7x + 3)$$

$$3(2x-1)(x-3)$$

x	$2x^2$	$-x$
x	$-6x$	3

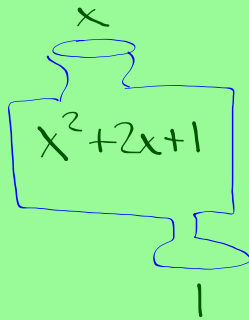
~~$6x^2$~~

~~$-7x$~~

1st

$-6x$	$-x$
$-3x$	$-2x$

~~$$6x^2 - 21x + 9 = 0$$~~

HW QUESTIONS

answers to

(75)

$$\text{Solve } x^2 + 2x + 1 = 1$$

$$\text{So } x = 0 \text{ or } x = -2$$

$$-1 = x^2 + 2x + 1$$

$$0 = x^2 + 2x$$

$$0 = x(x+2)$$

ZPP

$$x = 0 \quad x + 2 = 0$$

(76) Which value of x allows you to find the y -intercept?

$$x = 0$$

Find y -intercepts

a) $y = 3x + 6$ $(0, 6)$

b) $x = 5y - 10$ $(0, 2)$

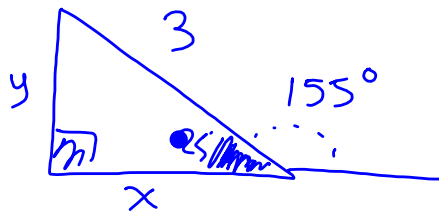
c) $y = x^2$ $(0, 0)$

d) $y = 2x^2 - 4$ $(0, -4)$

e) $y = (x - 5)^2$ $(0, 25)$

f) $y = 3x^3 - 2x^2 + 13$ $(0, 13)$

67



$$\boxed{70} \quad a \quad \frac{3}{x} + \frac{6}{-6} = \frac{-45}{-6}$$

$$\frac{3}{x} = -51$$

70b

$$\cancel{40} \left(\frac{x-2}{\cancel{5}} \right) = \cancel{40} \left(\frac{10-x}{\cancel{80}} \right)$$

$$\frac{x-2}{5} = \frac{10-x}{8}$$

$$8(x-2) = 5(10-x)$$

$$8(x-2) = 5(10-x)$$

$$8x - 16 = 50 - 5x$$

$$+5x$$

$$+5x$$

$$13x - 16 = 50$$

$$13x = 66$$

$$x = \frac{66}{13}$$

70c

$$(x+1)(x-3) = 0$$

71

find points
of intersection

$$f(x) = x^2 - 2x + 6$$

$$g(x) = 2x + 1$$

$$x^2 - 2x + 6 = 2x + 1$$

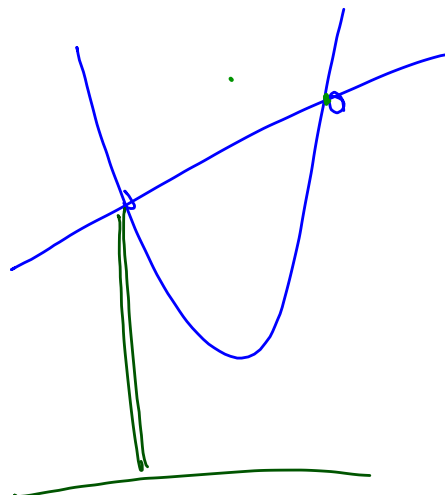
$$x^2 - 4x + 5 = 0$$

$$(x+1)(x-5) = 0$$

$$\downarrow \quad \downarrow$$

$$x+1=0 \quad x-5=0$$

$$x=-1 \quad x=5$$



71 b

$$f(x) + g(x)$$

c

$$f(x) - g(x)$$

72

a

$$y = \frac{3}{5}x + 1$$

b

$$3x + 2y = 6$$

c

$$y = x^2$$

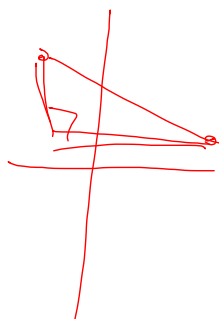
d

$$y = x^2 - 100$$

74

 $(-2, 5)$ $(5, 2)$

$$d = \sqrt{(-)^2 + (-)^2}$$



74

 $(-2, 5)$ $(5, 2)$

$$m = \frac{5 - 2}{-2 - 5} = \left(\frac{3}{-7} \right)$$

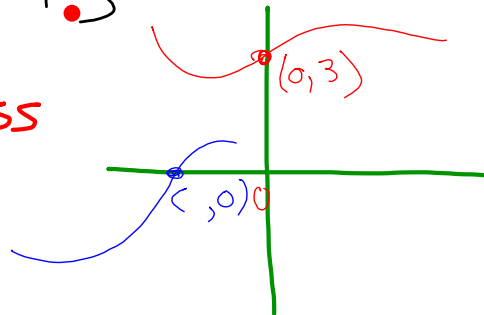
$$= -\frac{3}{7}$$

75

$$\boxed{76} \quad f \quad y = \cancel{3}x^3 - \cancel{2}x^2 + 3$$

↑ ↑
0 0

Where does it cross
the y-axis?



- ① Check your HW using the Solutions.
- ② Record your scores as usual.

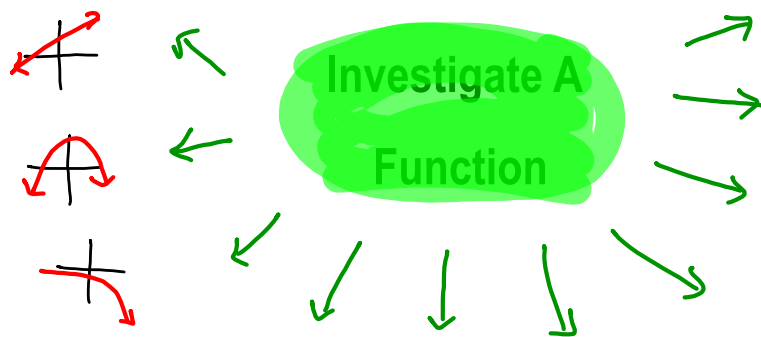
Random HW Quality Check

the assignment that was due
last Friday

II... 67, 70-72, 74b, 75-76

Today you will learn
a "Big Picture" skill

that can be applied throughout
the rest of the Algebra 2 course.



Many families
of functions

GOALS:
→

Completely describe a function
by making summary
statements.

NOTES TAPED
INTO



NOTES

Analyze Functions

Function Investigation Questions

to help make *Summary Statements about Functions*

1. Sketch the graph and Describe the Shape.
2. Describe any special points (if any) and show the coordinates of their location? (besides x- and y-intercepts)
3. What is the domain?
4. What is the range?

5. End behavior - What happens to the *y-values* when *x* increases to ∞ ? when *x* decreases to $-\infty$?
6. Axis intercepts:
 - a. What is the y-intercept? (when $x=0$)
 - b. What are the x-intercept(s)? when $y=0$
7. Asymptotes:
 - a. Are there any vertical asymptotes? If so what are their equations?
 - b. Are there any horizontal asymptotes? If so what are their equations?
8. What kind of symmetry does this function have? (if any) (y-axis symmetry?, rotational symmetry?)

In order to do that you
need a solid understanding
of **ASYMPTOTES**

graph $f(x) = \frac{1}{(x-7)}$ $\frac{1}{x} - 7$

From the table look at the y-values
associated with the five x-values below
7 and the five above

What is the x-value
that has no y-value?

$$\frac{1}{x-7}$$

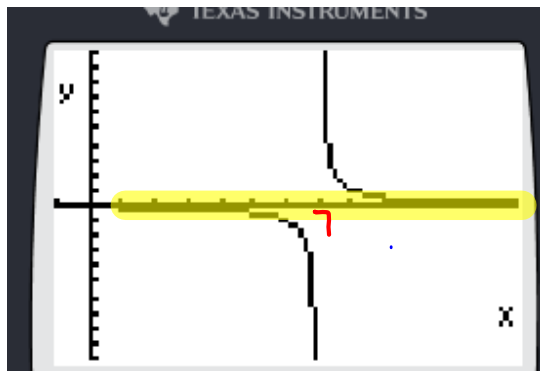
$$\frac{1}{7-7}$$

$$\frac{1}{0}$$

∞

x	y
2	-0.2
3	-0.25
4	$-0.\bar{3}$
5	-0.5
6	-1
7	undef.
8	1
9	0.5
10	$0.\bar{3}$
11	0.25
12	0.2

What is the x-value
that has no y-value?



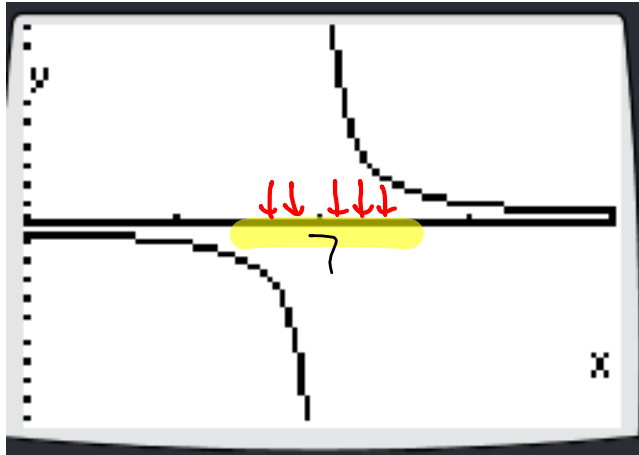
domain

x	y
2	-0.2
3	-0.25
4	$-0.\bar{3}$
5	-0.5
6	-1
7	undef.
8	1
9	0.5
10	$0.\bar{3}$
11	0.25
12	0.2

Focus on
y-values

Very close

$$x=7$$



Now Use table set to

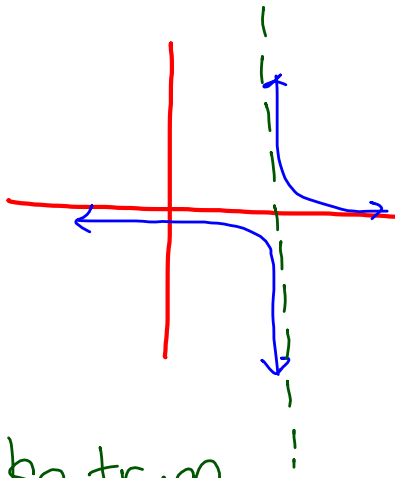
start at 5 with an incremental change
of 0.1



Next ... incremental change of

• 0.01

In Alg Log, create the table and make the sketch



Use trace
 ↵ enter

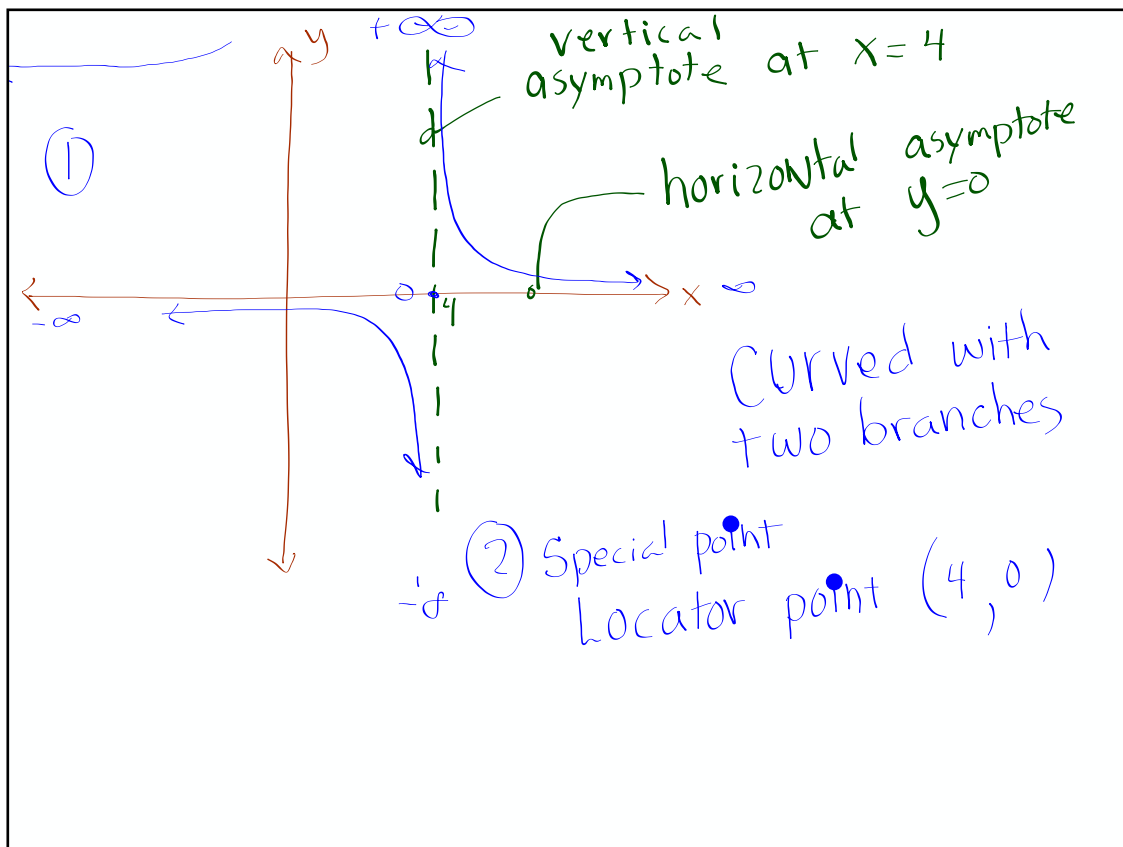
x	y
6.5	
6.7	
6.9	
6.99	
6.999	
7.001	
7.01	
7.1	
7.3	
7.5	

The closer we get to $x=7$
 the y-values get infinitely large
 or small.

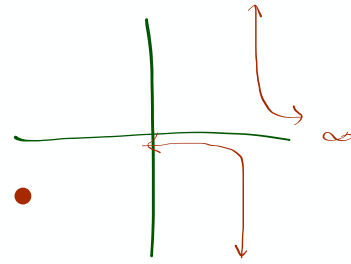
.... which is an **asymptotic** situation

Analyze $g(x) = \frac{1}{x-4}$

Investigate your function using the
8 questions



③ domain:
 $-\infty < x < \infty$ but $x \neq 4$



④ range
 $-\infty < y < \infty$ but $y \neq 0$

⑤ END behavior

Ⓜ As $x \rightarrow \infty$, $y \rightarrow 0$

Ⓛ As $x \rightarrow -\infty$, $y \rightarrow 0$

⑥ y-int $(0, -0.25)$

x-int $(\quad, 0)$
 are none

⑦ Vertical asymptote at $x=4$

horiz. asympt at $y=0$

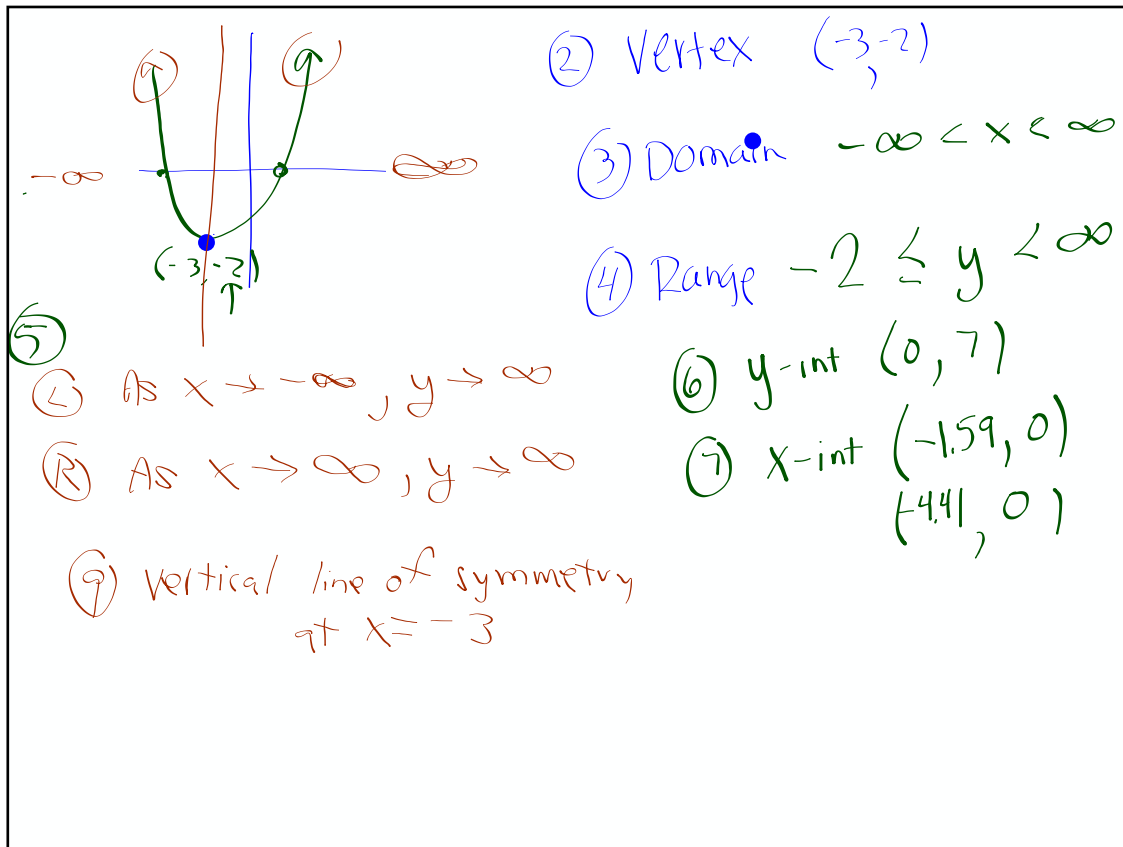
⑧ x-axis symmetry? No No symmetry

BB.

ANALYZE

$$y = (x + 3)^2 - 2$$

Using the 8 investigation questions



Assignment

1 - 84, 86, 89ade, 91, 93, 95, 97

↑
do quickly
with
GDC

Use the 8 Function
Investigation Questions

September 17, 2018

