

① Use homework tally as needed

② Warm Up

Factor

$$60x^2 - 210x + 90$$

Hint

First factor out everything that is common!

$$60x^2 - 210x + 90$$

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

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

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

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

	x	-3
$2x$	$2x^2$	$-6x$
-1	$-x$	3

~~$$6x^2$$~~
~~$$-7x$$~~

↓ Add

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

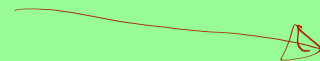
HW QUESTIONS

answers to

(75)

Solve
 $2x^2 + 2x + 1 = 1$
 So $x = 0$ or $x = -2$

(76)



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

$$x = 0$$

Find y -intercepts

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

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

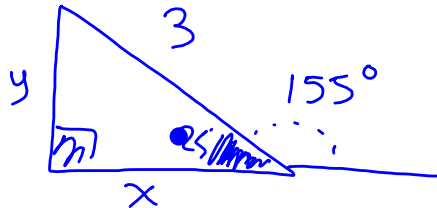
c) $y = x^2$ $(0, 0)$

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

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

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

67



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

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

$\boxed{70b}$

$$\frac{40(x-2)}{\cancel{5}} = \frac{\cancel{40}(10-x)}{\cancel{81}}$$

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

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

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

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

$$13x - 16 = 50$$

$$13x = 66$$

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

$$\boxed{70c} \quad (x+1)(x-3) = 0$$

$\boxed{71}$ find points of intersection

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

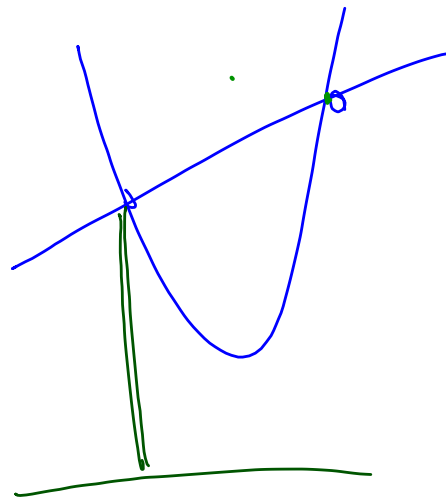
$$g(x) = 2x + 1$$

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

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

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

$$\begin{array}{l} \downarrow \qquad \downarrow \\ x+1=0 \quad x-5=0 \\ x=-1 \quad x=5 \end{array}$$



$$71 \text{ b} \quad f(x) + g(x) \quad \text{c} \quad f(x) - g(x)$$

$$72 \quad \text{a} \quad y = \frac{3}{5}x + 1 \quad \text{b} \quad 3x + 2y = 6$$

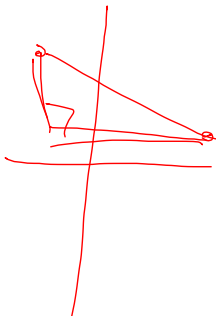
$$\textcircled{c} \quad y = x^2$$

$$\textcircled{d} \quad y = x^2 - 100$$

74

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

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



74

 $(-2, 5)$ $(5, 2)$
↑ ↑

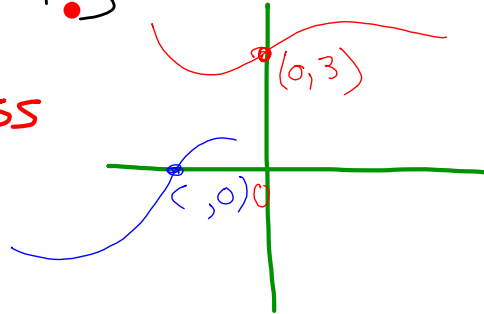
$$m = \frac{5 - 2}{-2 - 5} = \left(\frac{3}{-7} \right)$$

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

75

76 f $y = 3x^3 - 2x^2 + 3$

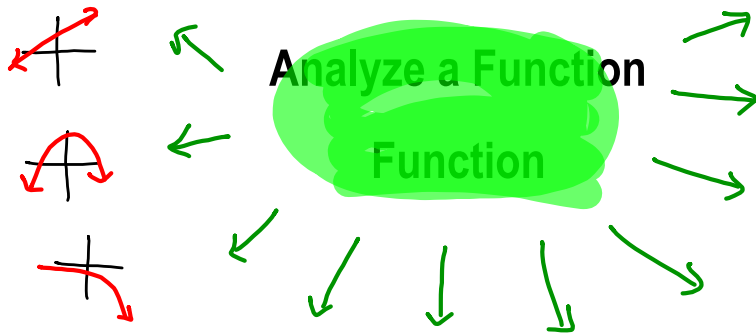
Where does it cross
the y-axis?



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

GOALS:
→

Analyze Functions [8 things]



Many families
of functions

NOTES TAPED
INTO



NOTES

Analyzing Functions

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 $+\infty$? 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? $x = 3$ for example
 - b. Are there any horizontal asymptotes? If so what are their equations? $y = 4$ for example
8. What kind of symmetry does this function have? (if any) (y-axis symmetry? x-axis symmetry? rotational symmetry?)

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

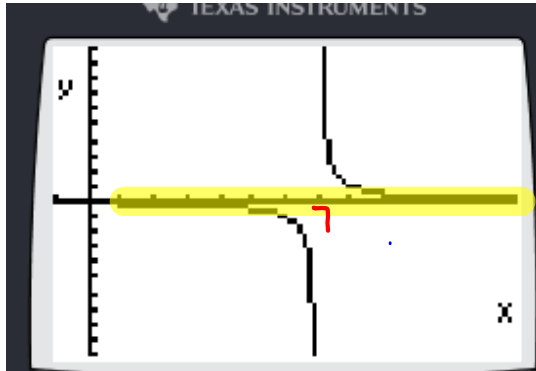
graph $f(x) = \frac{1}{(x-7)}$ $y = \frac{1}{x} - 7$

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?

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

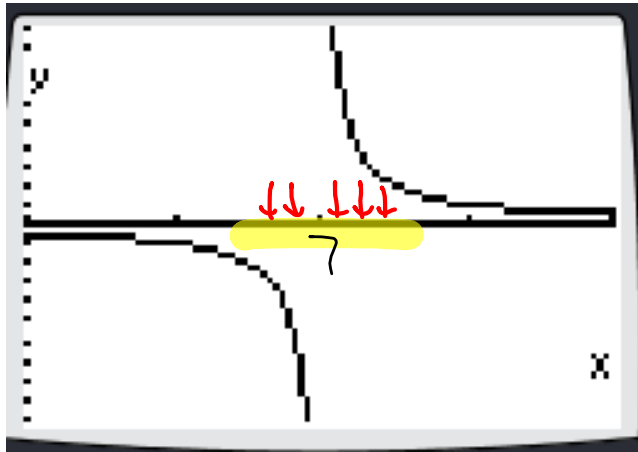
What is the x-value
that has no y-value?



x	y
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domain

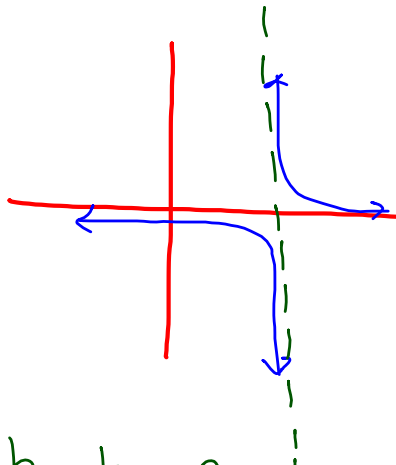
Focus on
y-values
Very close
 $x=7$



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.

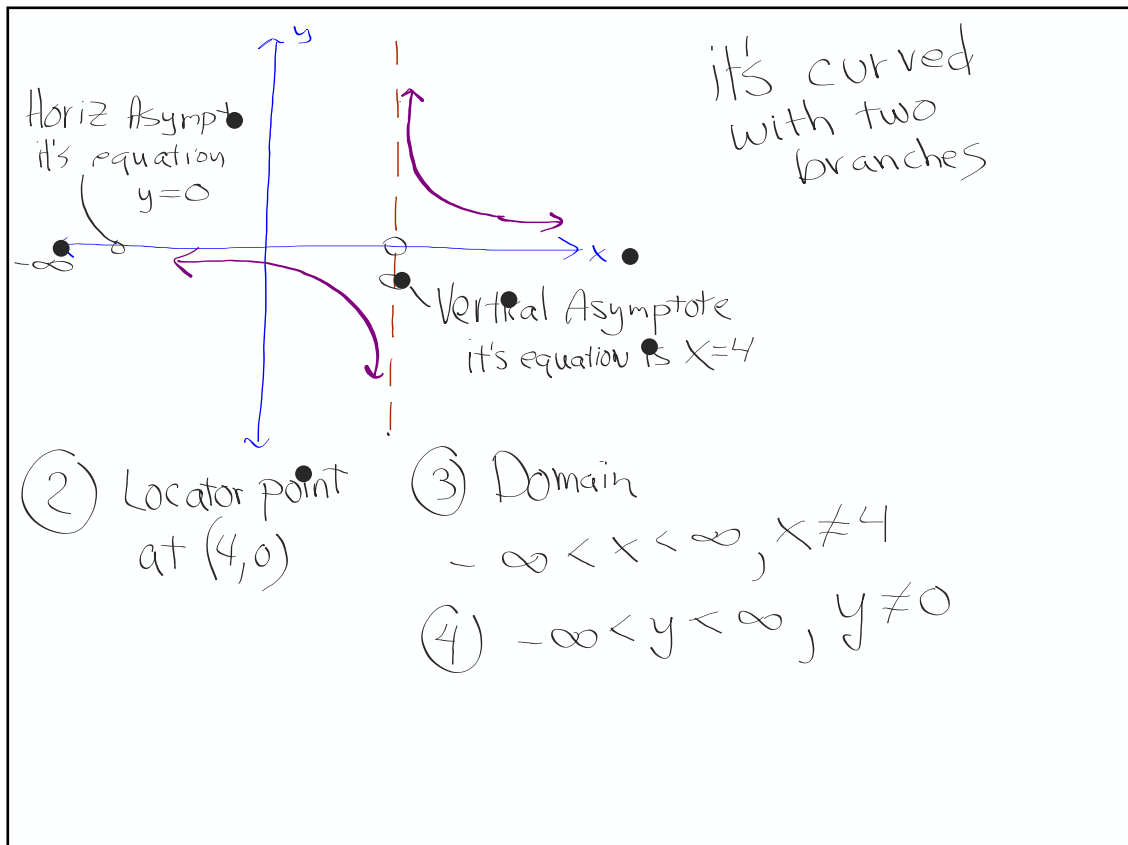
.... which is an **asymptotic** situation

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

$\frac{0}{0}$

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

Investigate your function using the
8 questions



End Behavior (behavior of the y -values)

(5) L 0

R 0

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

R As $x \rightarrow +\infty$, $y \rightarrow 0$

~~(6) VA: $x=4$~~

(6) y -int $(0, -25)$

x -int ~~(0)~~ none

(7) VA $x=4$

HA $y=0$

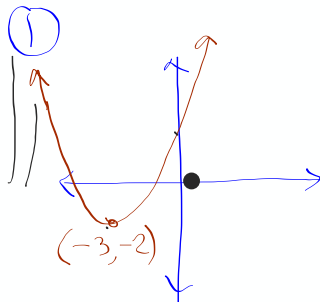
(8) ~~180°~~ Rotat
Rotational symm.
w.r.t. $(4, 0)$

BB.

ANALYZE

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

Using the 8 investigation questions



parabola that opens upward

② Vertex
(-3, -2)

③ domain = $-\infty < x < \infty$ ⑦

④ range = $-2 \leq y < \infty$

⑤ End behavior

Ⓐ AS $x \rightarrow -\infty$, $y \rightarrow \infty$

Ⓑ AS $x \rightarrow +\infty$, $y \rightarrow \infty$

⑥ y-int (0, 7)
x-int: (-1.41, 0) (-4.41, 0)

Assignment

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

↑
do quickly
with
GDC

Use the 8 Function
Investigation Questions