Let me know if there is a HW problem you want me to go over.

HW Tally: **You should put up a maximum of 2 or 3 problems (the ones you need the most help with). If you need help with more, then you should be coming in for help before school !**

Pick Up the Warm Up

1) Solve for ***m*** (in other words, re-arrange the equation to isolate m)

$3(n) = \frac{3(7)}{3}m - (10)3$ or $3(n)+3(10) = \frac{3(7)}{3}m$

$3n + 30 = 7m$

Clear out the fractions ASAP

$3n = 7m - 30$
$+30 \quad +30$

$\frac{3n+30}{7} = \frac{7m}{7}$

$m = \frac{3n+30}{7}$ $m = \frac{3n}{7} + \frac{30}{7}$

2 Find the error in the solution at right. Explain what the error is and solve the equation correctly. Be sure to check your answer.

$\frac{5}{x} = x - 4$

$x \cdot \frac{5}{x} = (x) - (4)x$

$5 = x - 4$

$x = 9$

$(x)\frac{5}{x} = x(x) - 4(x)$

$5 = x^2 - 4x$

$-5 \qquad -5$

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

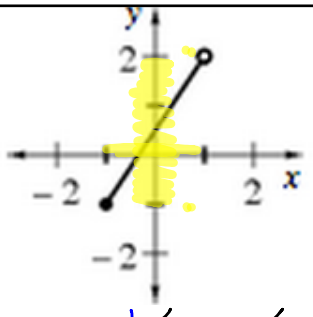
$0 = (x+1)(x-5)$

ZPP

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

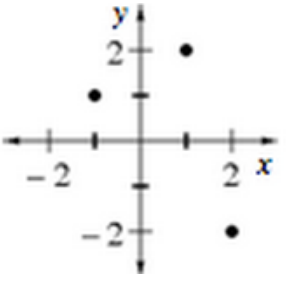
$x = -1 \qquad x = 5$

3



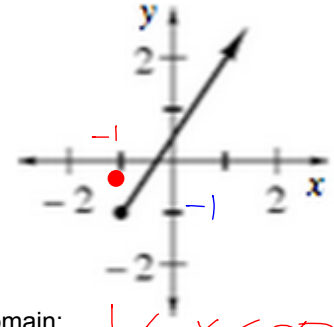
Domain: $-1 \leq x < 1$

Range: $-1 \leq y < 2$



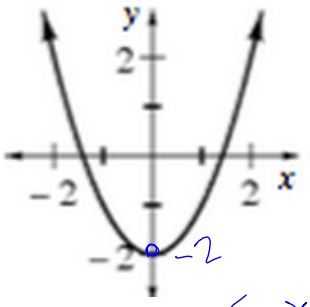
Domain: $-1, 1, 2$

Range: $-2, 1, 2$



Domain: $-1 \leq x < \infty$

Range: $-1 \leq y < \infty$



Domain: $-\infty < x < \infty$

Range: $-2 \leq y < \infty$

(3) Show how to find the y-axis intercept AND x-axis intercept(s) algebraically of the following function. when you are done, you can check with your calculator.

$y = x^5 - 18$

x-intercept

Set $y = 0$

$x^5 - 18 = 0$

$\sqrt[5]{x^5} = 18$

$\sqrt[5]{\quad} \quad \sqrt[5]{\quad}$

$x = \sqrt[5]{18}$ ✓

≈ 1.78

$(\sqrt[5]{18}, 0)$

y-intercept

Set $x = 0$

$y = 0^5 - 18$

$y = -18$

$(0, -18)$

(4) Making "ONES"

$\frac{5}{5} = 1$ $\frac{x}{x} = 1$ $\frac{x \cdot x}{x \cdot x} = 1$ $\frac{x^3}{x^2} = 1$ $\frac{4n^3}{n^3} = 4$

$\frac{n \cdot n \cdot n}{n \cdot n} = n$ $\frac{n^3}{n^2} = n$ $\frac{m^4 \cdot m^6 \cdot b^2}{m^6 b^2} = m^4$

$\frac{z \cdot z \cdot z}{z \cdot z \cdot z \cdot z \cdot z} = \frac{1}{z^2}$ $\frac{z^3}{z^5} = \frac{1}{z^2}$ $\frac{10x}{3x^2} = \frac{10}{3x}$

$n^2 \frac{n^{502}}{n^{500}} = \frac{n^2}{1} = n^2$ $\frac{x^{100}}{x^{120}} = \frac{1}{x^{20}}$

(5) There are seven exponent "laws", two of which can be tricky.

$\frac{a^m}{a^n} = a^{m-n}$ and $(ab)^m = a^m b^m$

$\frac{x^5}{x^3} = x^{5-3} = x^2$ or just make "ones" instead $\frac{x^5}{x^3}$

$\frac{a^4}{a^6} = a^{4-6} = a^{-2} = \frac{1}{a^2}$ or just make ones instead $\frac{a^4}{a^6} =$

$\frac{4x^1y^2t}{5mx^4} = \frac{4y^2t}{5mx^3}$ (x^3)

$(5x^3)^2 = 5^2(x^3)^2 = 25x^6$ (5x5)

$(2n^2m)^4 = 2^4(n^2)^4m^4 = 16n^8m^4$

$(-2m^3)^3 =$

$-8m^9$

$(-2)^3 (m^3)^3$

$-2 \cdot -2 \cdot -2$

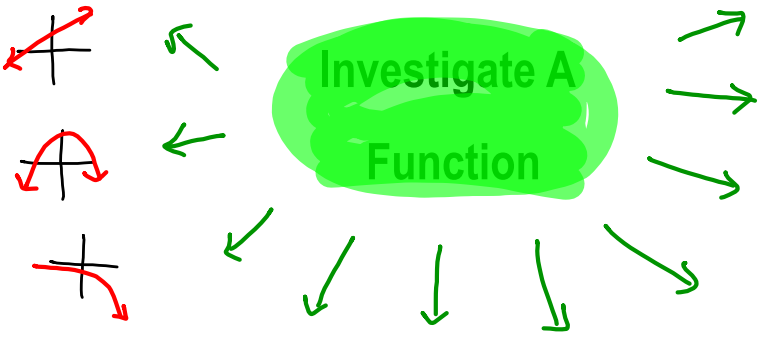
$(-3n^2e^3)^2 =$

$(-3)^2 (n^2)^2 (e^3)^2$

$9n^4e^6$

HW QUESTIONS

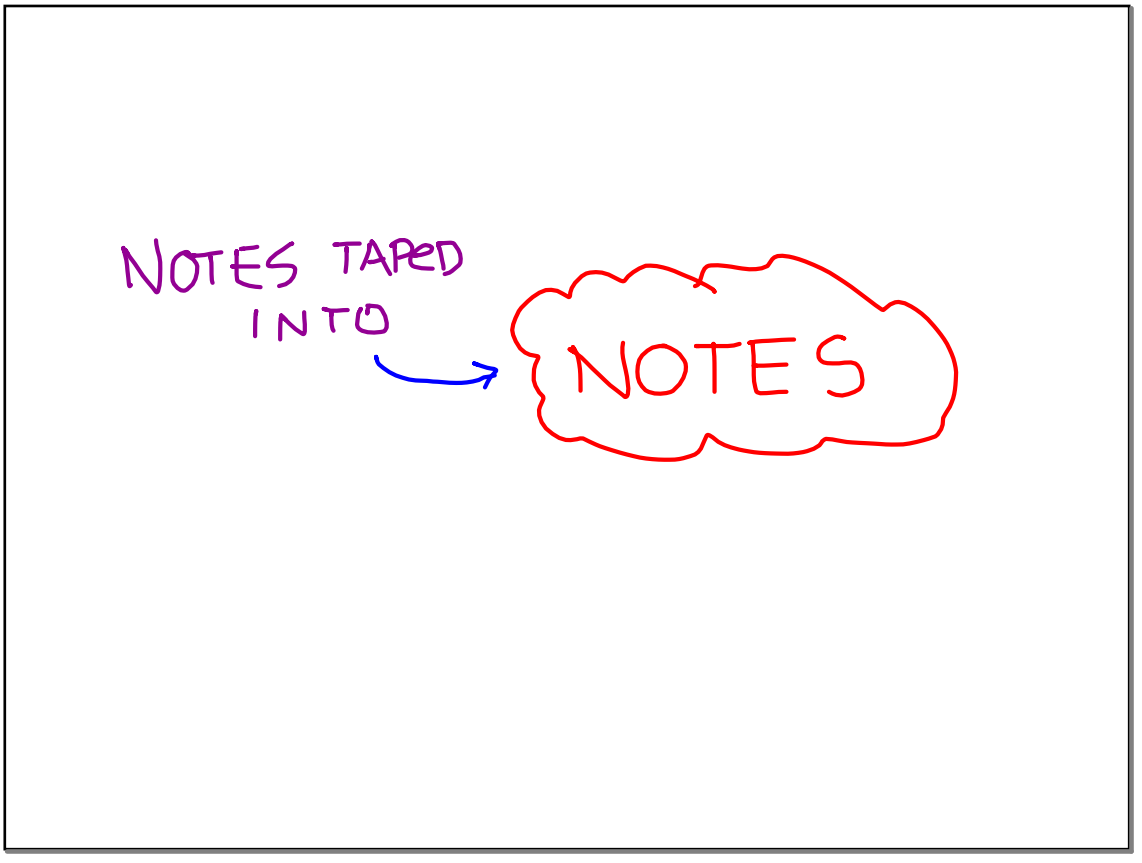
Today you will learn a "Big Picture" skill that can be applied throughout the rest of the Algebra 2 course.



Many families of functions

GOALS:

Completeley describe a function by making summary statements.



Function Investigation Questions

to help make Summary Statements about Functiions

1. Describe the Shape of the Graph (and sketch it)
2. Describe any special points (if any) and their location ? (besides x- and y-intercepts)
3. What is the maximum or minimum y-value (if any) denoted as y_{max} or y_{min} .
4. What is the domain ?
5. What is the range ?

6. End behavior - What happens to the *y-values* when *x* increases to ∞ ? when x decreases to $-\infty$?

7. Axis intercepts:
   a. What is the y-intercept?

   b. What are the x-intercept(s)?

8. 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?

9. What kind of symmetry does this function have? (if any) (y-axis symmetry?, rotational symmetry?)

10. .

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

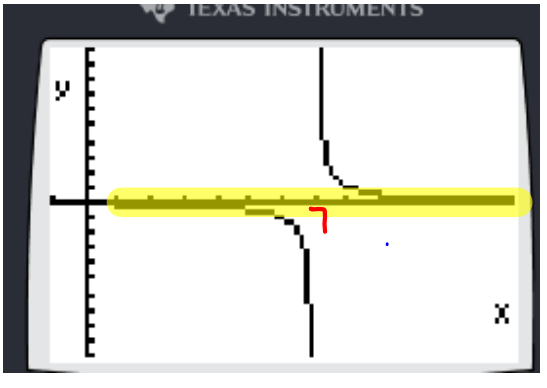
graph $f(x) = \frac{1}{x-7}$

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	$-0.\overline{3}$
5	−0.5
6	−1
7	undef.
8	1
9	0.5
10	$0.\overline{3}$
11	0.25
12	0.2

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



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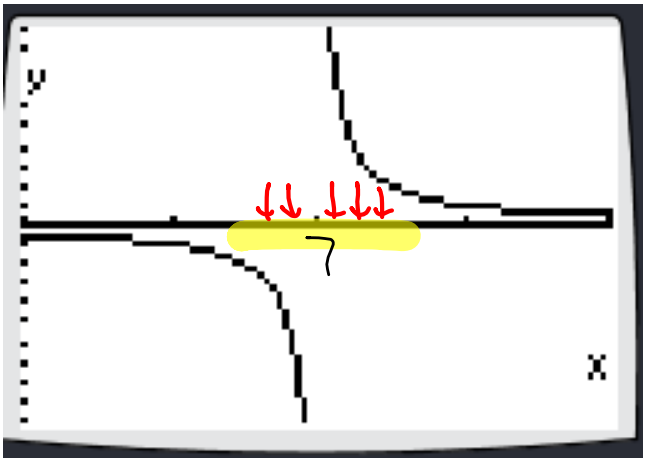
domain

Focus on y-values

Very close

$X = 7$



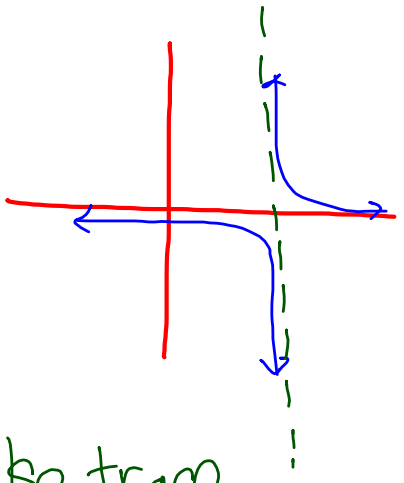
Now Use table set to

start at 5 with an incremental change of 0.1

Next ... incremental chage 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	$-\infty$
7.1	
7.3	
7.5	

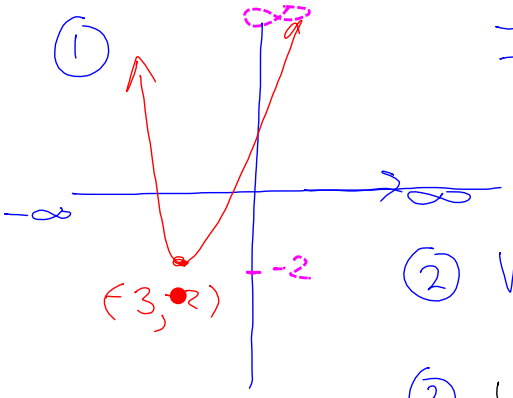
The closer we get to $x=7$

the y-values get infinitely large or small.

..... *which is an* **asymptopic** *situation*

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

Using the 9 investigation questions



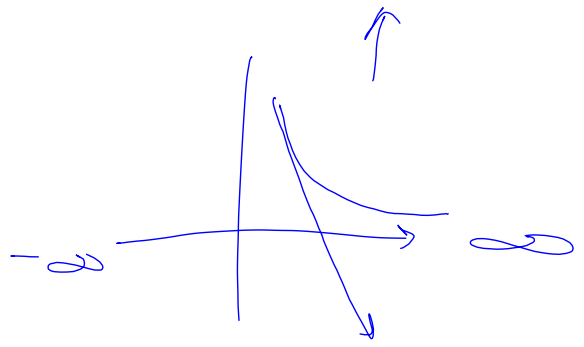
It's a parabola, opening upward with a vertex of $(-3,-2)$

② Vertex of $(-3,-2)$

③ $y_{min} = -2$

④ domain: $-\infty < x < \infty$

⑤ range: $-2 \leq y < \infty$



(6) As $x \to -\infty$, $y \to \infty$

As $x \to \infty$, $y \to \infty$

(7) x-int $(-4.414, 0)$ $(-1.585, 0)$

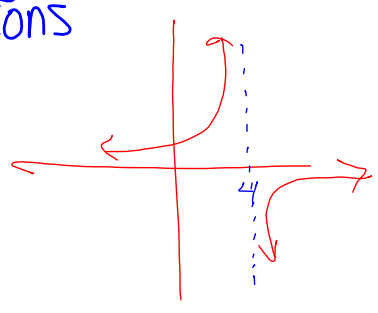
y-int $(0, 7)$

(8) NO asymptotes

BB.

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

Investigate your function using the 9 questions



Assignment

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

do quickly with GDC

Use the 9 Function Investigation Questions