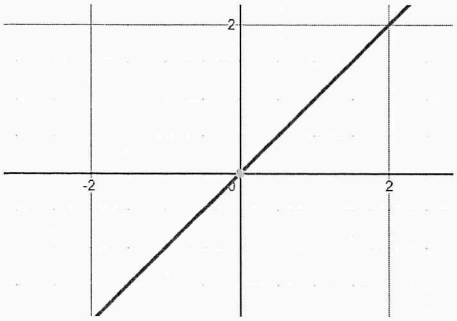
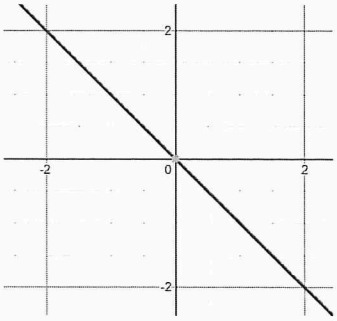
Assignment #21 Review #2

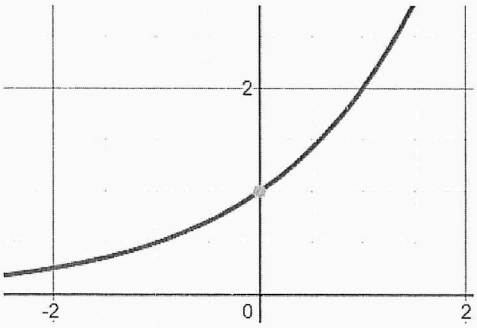
I can describe the rate of change. You should be able to apply this same thinking to graphs given a certain interval.



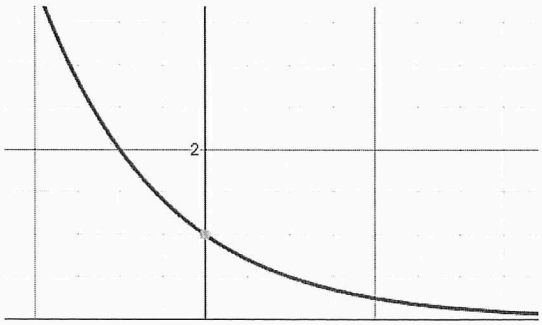
Positive constant rate of change



Negative constant rate of change

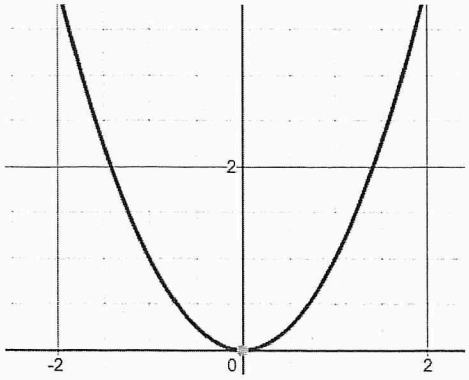


Positive rate of change at an increasing rate. It is not constant like the line. As you read the graph from left to right, the rate of change is getting bigger and bigger with each interval.



Negative rate of change at a decreasing rate. It is not constant like the line. as you read the graph from left to right, the rate of change is getting smaller and smaller with each interval.

What if we had a quadratic function. We should be able to look at a certain interval and apply some of this same reasoning.



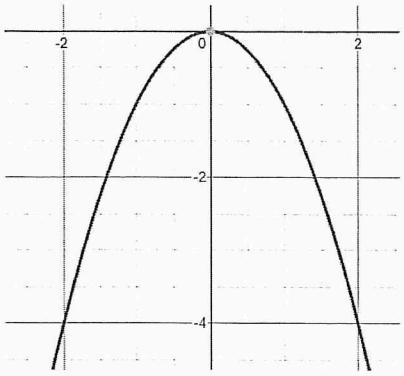
Describe the rate of change on the interval $-2 \leq x < 0$

Answer: On this interval, we have a negative rate of change that is also decreasing. As I read from left to right on this interval, the rate of change is getting smaller and smaller. At the point (0,0) the rate of change is stationary. It is neither increasing nor decreasing.

Describe the rate of change on the interval $x>0$

Answer: On this interval, we have a positive rate of change and it is also increasing. As we read the graph from left to right on this interval, the rate of change is getting larger and larger.

1)You do now....

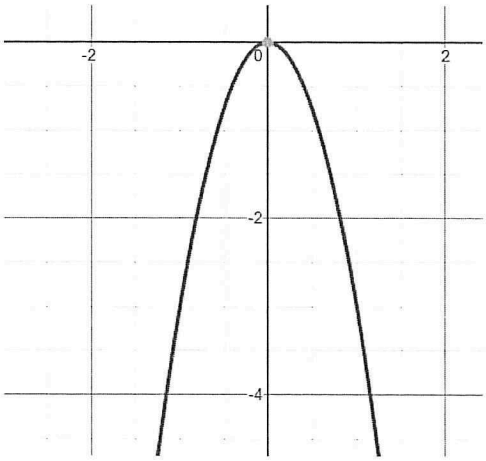


Describe the rate of change on the interval $-20 \leq x < 0$

The slopes are decreasing on this interval

Type your answer here

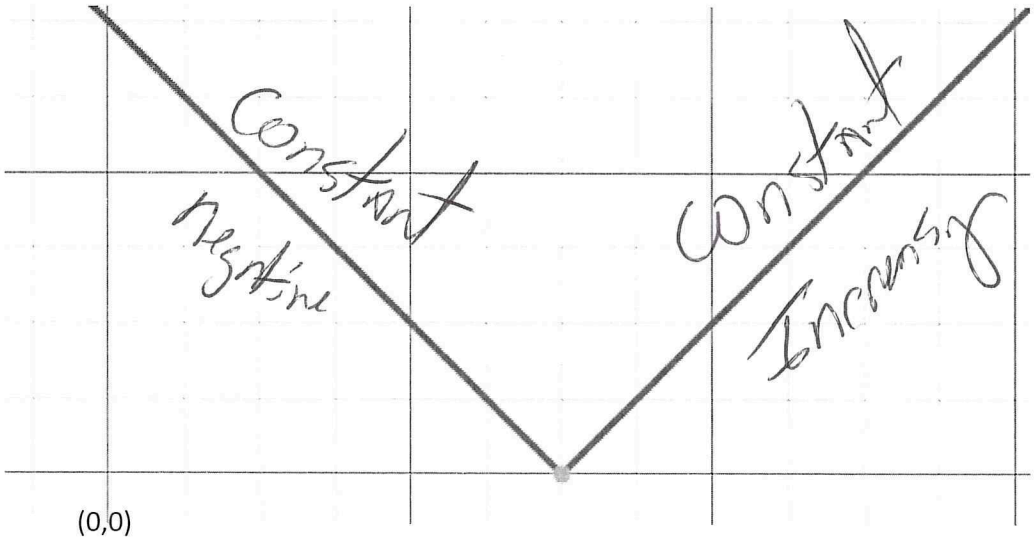
positive Rate of change At Decreasing Rate



Type your answer here

negative Rate of change
Increasing Rate
(getting More And More
negative

2) On the above graph, describe the rate of change on the interval $0< x \leq 22$



3) On the above graph, describe the rate of change on the interval $-32\leq x <6$

Constant Rate of change

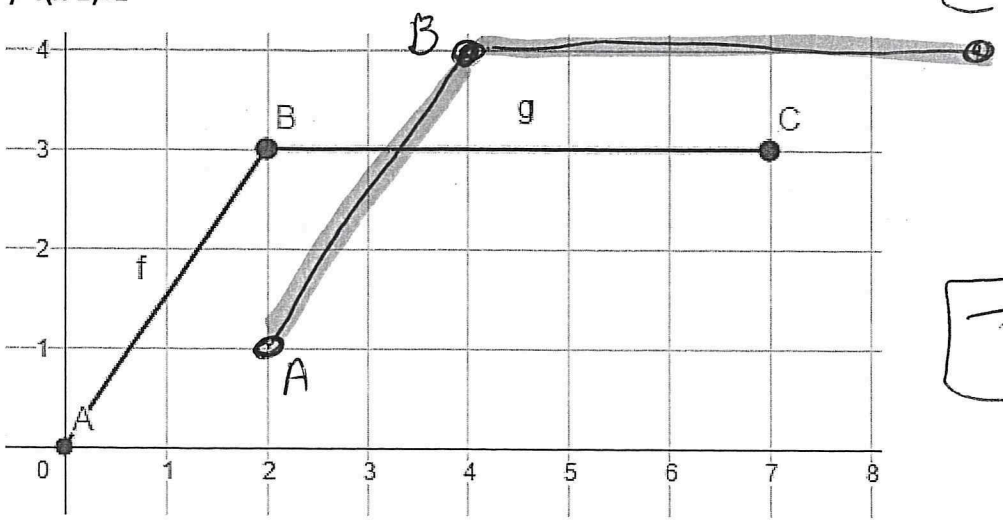
Type your answer here

negative Rate of change
~~Decreasing Rate~~
(~~Rates of change getting~~
~~Smaller~~)

You need to know your translation rules! You should be able to look at any graph and translate it using your rules. You should know very well the effects of **y=af(x-h)+k**

a- skinny or fat changes the I-O Relationship of the parent graph
h- moves graph left or right
k- moves graph up or down

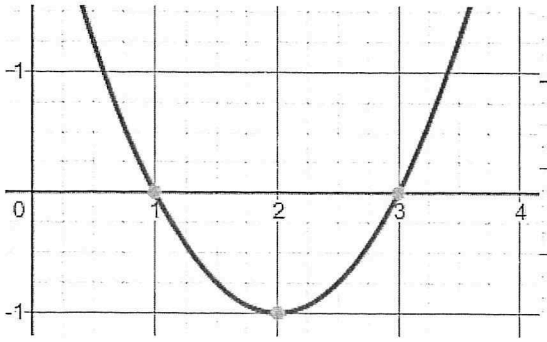
4) The graph below shows the graph of y=f(x). On the same axes draw the new graph following the rule **y=f(x-2)+1**

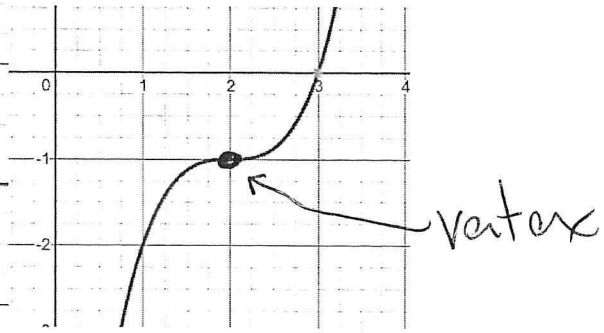


** This IS foundational And for sure IS on test.

Teeny shift Rules

5) Another major learning target in this Unit was recognizing our parent graphs and knowing vertex form. Write the following equations of the given graphs...



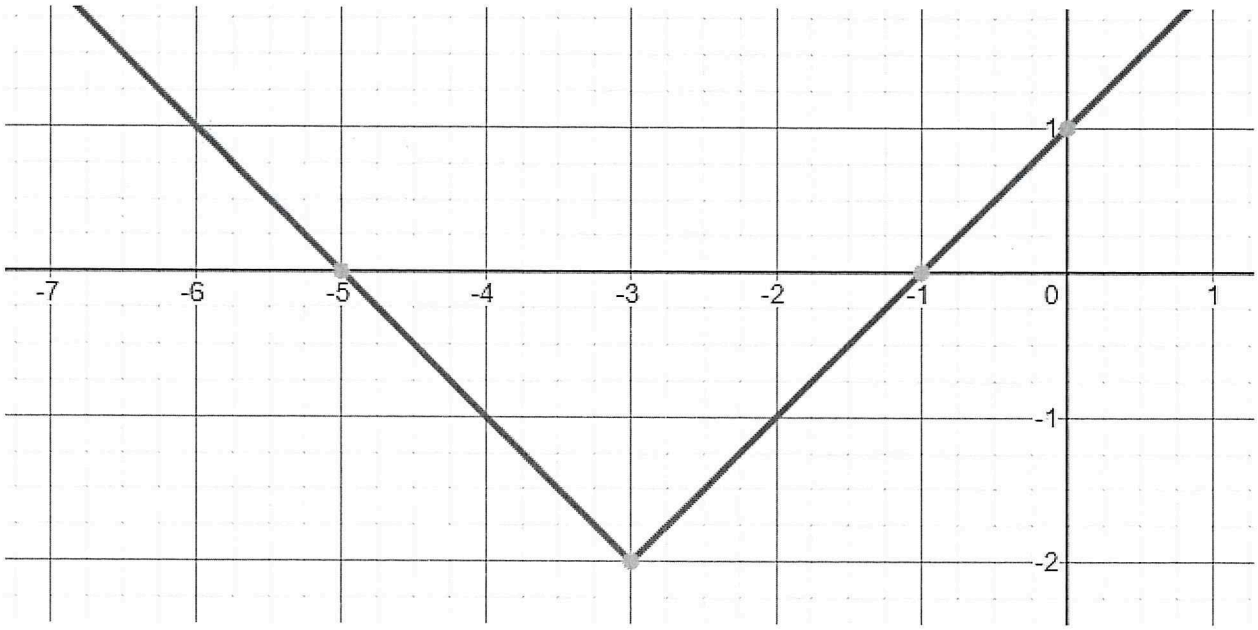


Equation of this quadratic

$y = (x-2)^2 - 1$

Equation of this cubic

$y = (x-2)^3 - 1$



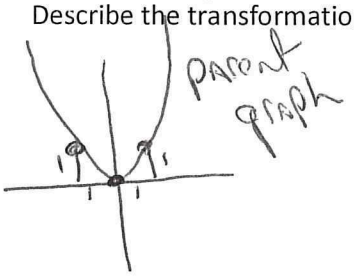
Equation of this absolute value

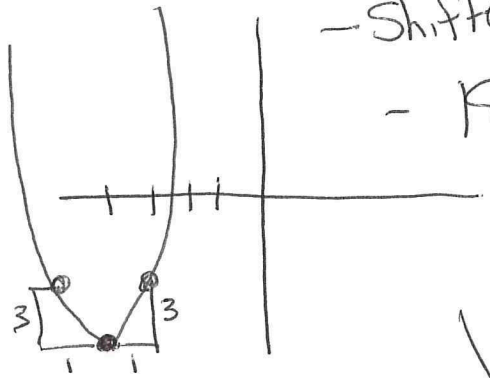
$|x+3| - 2$

very foundational And Important

6) We should know the effects of **y=af(x-h)+k** very well.

Describe the transformation of $y=3(x+4)^2-18$ compared to $y=x^2$

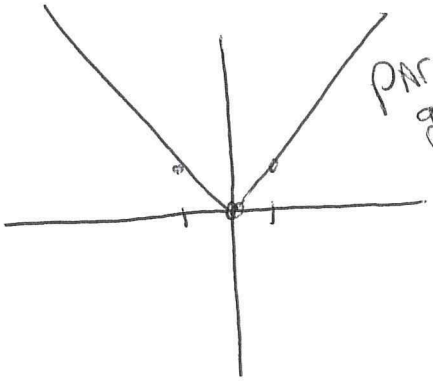




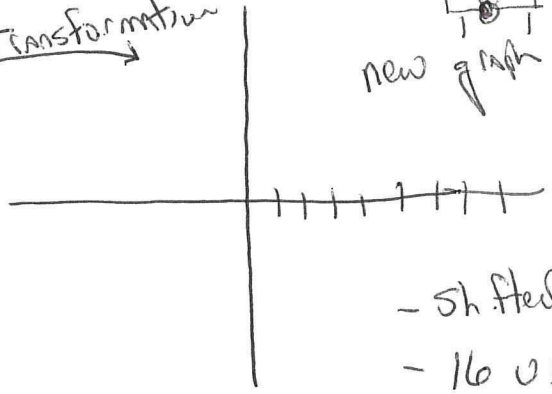
- shifted 4 to the left
- 18 down

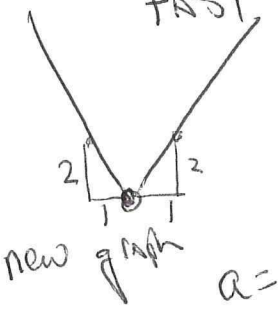
opens 3x as fast

Describe the transformation of $y=2|x-8|+16$ compared to $y=|x|$



Transformation



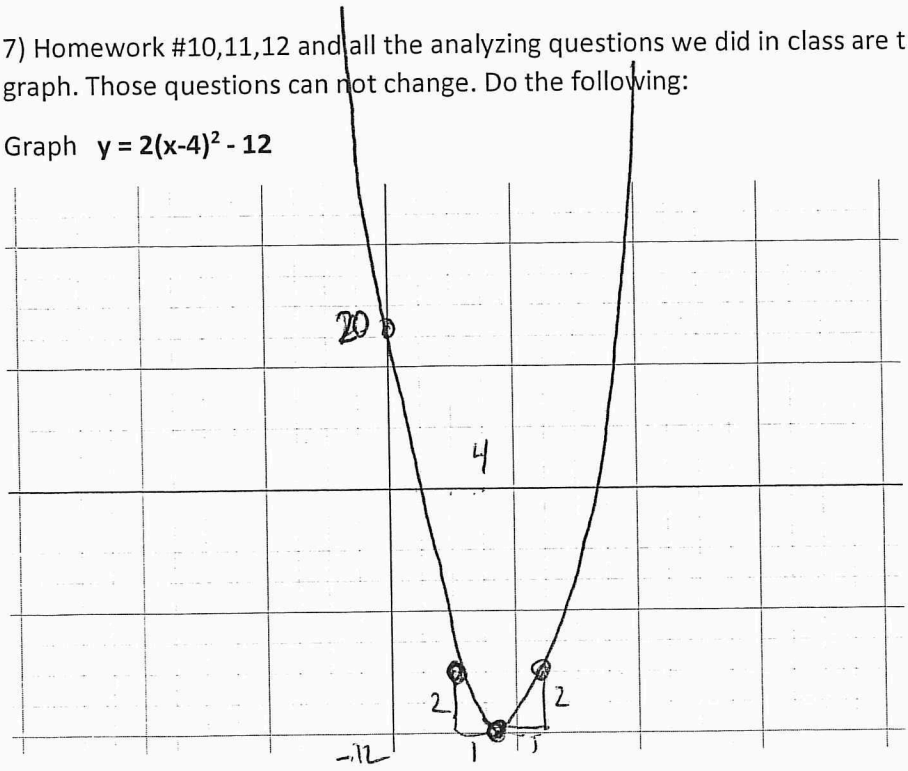


a=2 so it is over 1 up 2 from the vertex

- shifted 8 to the Right
- 16 up

7) Homework #10,11,12 and all the analyzing questions we did in class are the standard for analyzing a graph. Those questions can not change. Do the following:

Graph $y = 2(x-4)^2 - 12$



$2(x-4)^2 - 12 = 0$

$(x-4)^2 = 6$

$x - 4 = \pm 2.4$

$x = 6.4$
1.6

a) State the y intercept (0, 20)

b) State the x intercept(s) 6.4 And 1.6

c) Does this function have a maxima or minima? If so identify them

→ At the vertex (4, -12)

d) Using proper math terminology what is the domain?

All Real

e) Using Proper math terminology what is the range?

$y \geq -12$

f) For what x values is f(x) increasing?

when $x > 4$

g) For what x values is f(x) decreasing?

$-\infty < x < 4$

A little tricky → f) $g(x-3)^2+4$

$3((x-3)^2+4)$

$3(x-3)^2+12$

8) Function notation and Composition of functions is another algebraic topic we looked at during this unit.

Given $f(x) = (x-3)^2 + 4$ and $g(x) = 3x-2$ do the following:

a) f(5) 8
b) g(-2) −8
c) Find x when f(x) = 28 7.89 or −1.9
d) Find x when g(x)= 35 12.3
e) Find f(g(x))
f) Find g(f(x))

e) $f(3x-2)$ $(3x-2-3)^2+4$

$(3x-5)^2+4$

$28 = (x-3)^2+4$

$(x-3)^2 = 24$

$x-3 = \pm 4.9$

7.9 −1.9

d) $3x-2=35$

$3x=37$

$x=12.3$

Math Models: Being able to describe what function could represent some given data. Hint: Make a rough sketch of the points and see what graph it most closely represents.

Time spent	Money made
1	1.12
2	7.89
3	27

Which one of your parent functions in this unit would BEST describe this data?

Quadratic

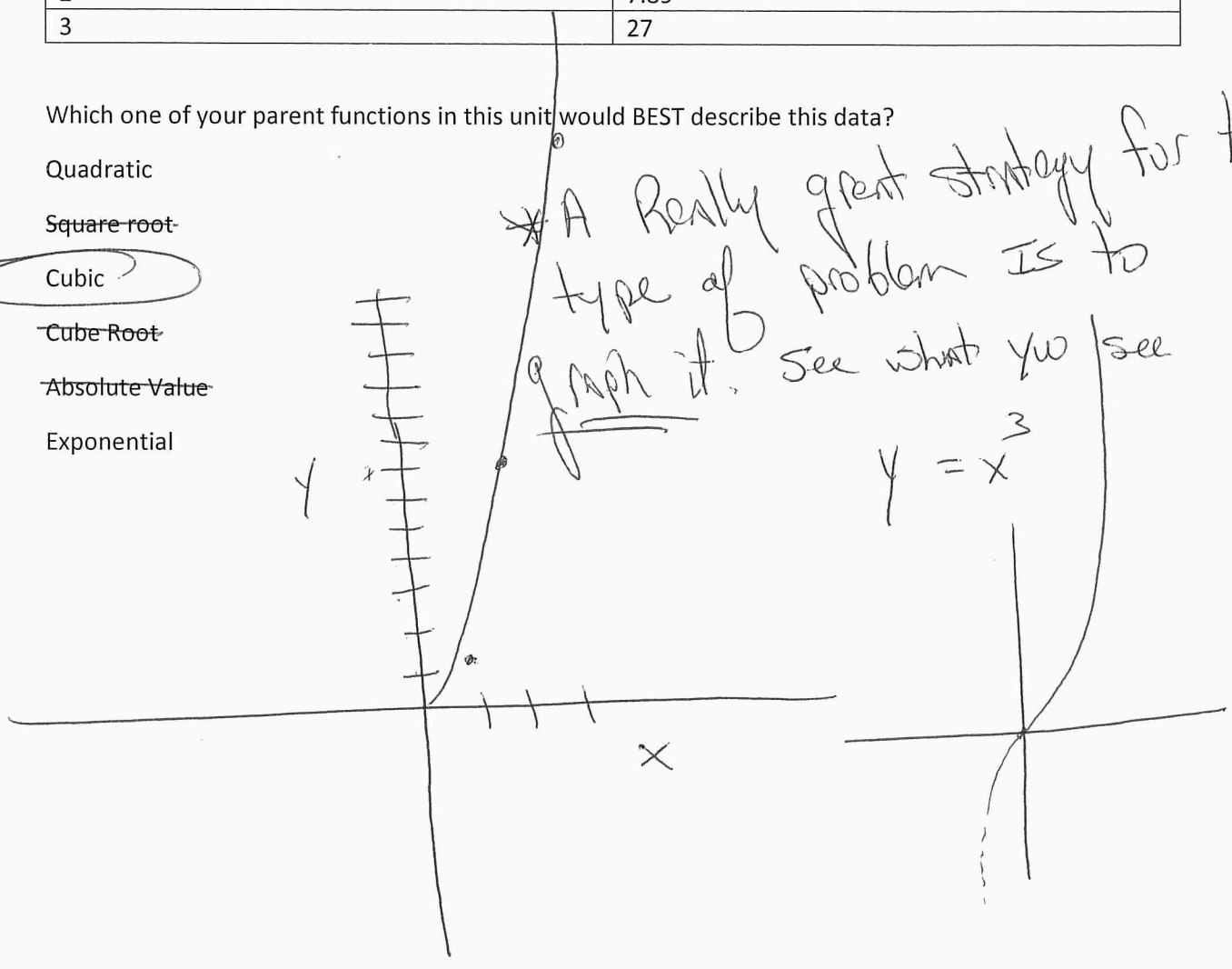
~~Square root~~

Cubic

~~Cube Root~~

~~Absolute Value~~

Exponential



* A Really great strategy for this type of problem is to graph it. See what you see

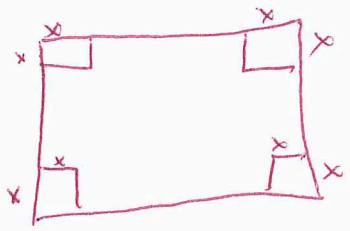
$y = x^3$

Finally, your Box problem was a major application in this unit.

You have a 12 by 14 piece of paper. You will be making an open top box. The equation that you will be making is Volume as a function of height(x)

Write the equation for this problem in factored form.

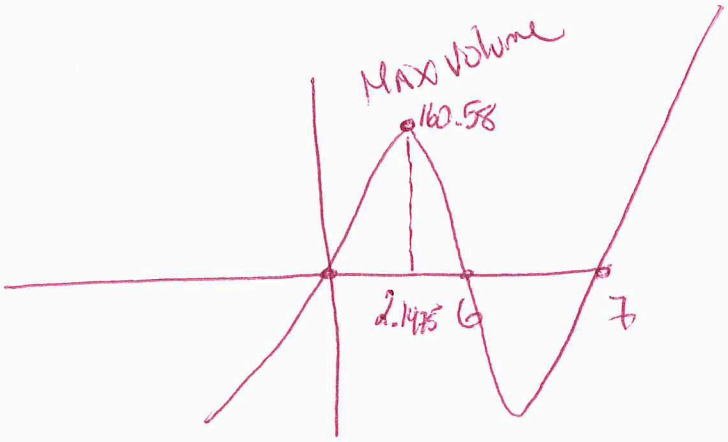
$y = x(12-2x)(14-2x)$



What are the roots of this function?

0, 6, 7

Sketch the graph of this function



What is the real life domain and why?

$0 < x < 6$

① I can not physically cut a square greater than 6 and still be able to fold up the box. It is impossible. The other Reason is negative volume does not make sense

Use your calculator to see the graph and use 2nd Calc #4 to find the maximum volume of this box

(2.1475, 160.58)