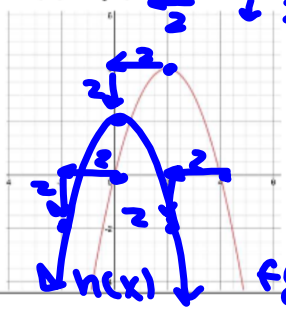
Bell Ringer

Tuesday 11/5

1. Given the graph of $f(x)$ below, sketch the graph of $h(x)$.

$h(x) = f(x+2) - 2$



2. Identify the vertex of each function:

$g(x) = (x+4)^2 - 7$

(-4, -7)

$h(x) = (x+3)(x-2)$

x = -3 x = +2

$\frac{-3+2}{2} = \left(-\frac{1}{2}, -\frac{25}{4}\right)$

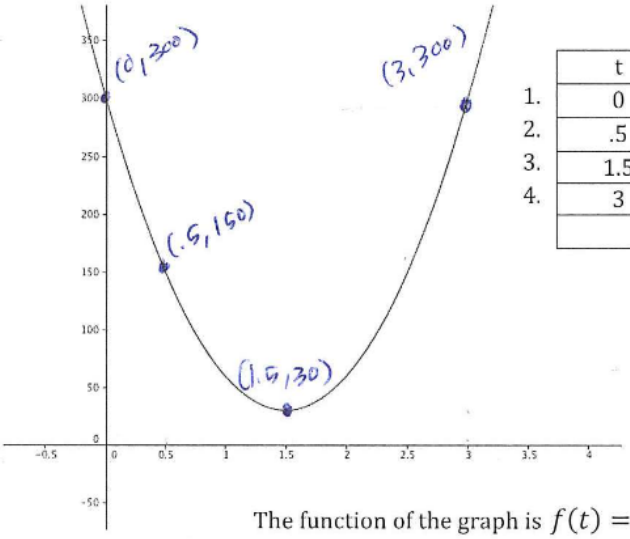
(-.5, -6.25)

Correct Average Rate of Change ws

Average Rate of Change ws
Bungee Breakdown

Name: Key **Hr:**_____

The graph below models the height of a bungee jumper in feet over the time interval of three seconds [0,3]. The lowest the jumper gets is 30 ft. above the ground. Use values on the graph or use the equation for the function to fill out the table. Then using your table answer the questions below.



	t	f(t)
1.	0	300
2.	.5	150
3.	1.5	30
4.	3	300

The function of the graph is $f(t) = 120x^2 - 360x + 300$

5) a. Using the values in your table, find the average rate of change (ARC) of the given interval: [0,1.5].

b. Interpret your answer. $\frac{30-300}{1.5-0} = \frac{-270}{1.5} = -180$

On average, he drops 180 ft in 1.5 seconds

6) a. Find an interval from where the person stops descent to where the bungee has no tension. [1.5, 3]

b. Interpret your answer $\frac{300-30}{3-1.5} = \frac{270}{1.5} = 180$

on average, ascends 180 ft in 1.5 seconds

7) a. Find an interval that will produce an ARC of 0. [0,3], [0.5, 2.5], or [1,2]

b. Why and when would this occur?

he's at the same height at both times so there is no change

8) Find the average rate of change for the given equation $h(t) = -9t^2 + 45t + 3$ for a soccer ball using the following time intervals

a) [1,2] $\frac{f(2)-f(1)}{2-1} = \frac{57-39}{1} = 18$

b) [2,4] $\frac{f(4)-f(2)}{4-2} = \frac{39-57}{2} = \frac{-18}{2} = -9$

c) [4,6] $\frac{f(6)-f(4)}{6-4} = \frac{-51-39}{2} = \frac{-90}{2} = -45$

9) a. Find the average rate of change over a time interval [2,3] for the given equation $h(t) = -16t^2 + 96t + 10$ for a golf ball. $\frac{f(3)-f(2)}{3-2} = \frac{154-138}{1} = 16$

b. What is happening to the golf ball during this interval?

raises 16 ft in 1 second

Use the tables below to answer questions 10-15.

Linear

Time (s)	Distance (ft)	
0	0	+3
1	3	+3
2	6	+3
3	9	+3
4	12	

Quadratic

Time (s)	Distance (ft)	
0	0	+3
1	3	+9
2	12	+15
3	27	+21
4	48	

Exponential

Time (s)	Distance (ft)	
0	0	+3
1	3	+6
2	9	+18
3	27	+54
4	81	

10. Is there a time interval when the rates of change are the same?

Yes, between 0 & 1 second

11. Which function has the greatest rate of change over the time interval from 2 seconds to 4 seconds?

Exponential $\frac{81-9}{4-2} = \frac{72}{2} = 36$

12. What observations can you make about the rate of change for the linear function over the time interval given? constant... +3 ft each second

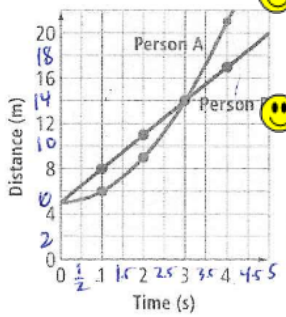
13. What observations can you make about the rate of change for the quadratic function over the time interval given? Increasing

14. What observations can you make about the rate of change for the exponential function over the time interval given? Increasing at a faster rate than quadratic

15. Which function has the greatest rate of change, and over what time interval?

Exponential [3,4] $\frac{81-27}{4-3} = \frac{54}{1} = 54$

16. Two people are running along parallel, straight tracks. The graph shows the distance each person has traveled.



a) At what times have the two runners traveled the same distance?

at 3 seconds

b) What is the average rate of change for the runners over the interval from 1 to 4 seconds, and who is traveling faster over that interval?

A: (1, 6) (4, 21) $\frac{21-6}{4-1} = \frac{15}{3} = 5$

B: (1, 8) (4, 17) $\frac{17-8}{4-1} = \frac{9}{3} = 3$

Person A

Week #11 Packet due!

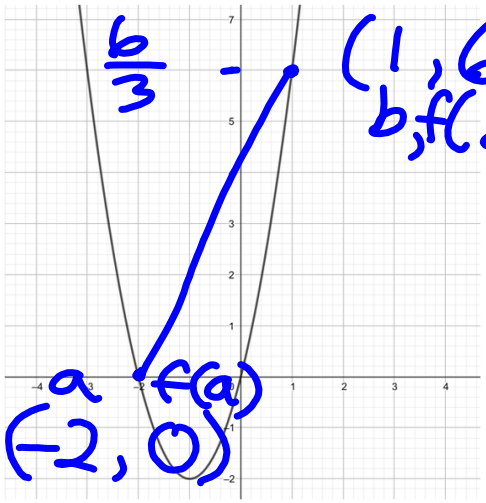
Applications of Quadratics with Graphs due tomorrow

Ch 3 Test Thursday
3A - Opp 2, 3B - Opp 1, 3C - Opp 1

Average Rate of Change Review...

Find the average rate of change over the interval [-2, 1]

a b



$$\frac{f(b)-f(a)}{b-a}$$

$$\frac{6-0}{1-(-2)}=\frac{6}{3}=2$$

Average Rate of Change Review...

Find the average rate of change over the interval [-4, 0]

a b

a -4	39 f(a)
-3	21
-2	9
-1	3
b 0	3 f(b)
1	9
2	21
3	39
4	63

$$\frac{f(b)-f(a)}{b-a}$$

$$\frac{3-39}{0-(-4)}=\frac{-36}{4}=-9$$

Average Rate of Change Review...

Find the average rate of change over the interval [0, 6]

a b

$$f(x) = \frac{1}{2}x^2 - 4x + 6$$

(0) (6)

$$\frac{f(b) - f(a)}{b - a}$$

$$\frac{0 - 6}{6 - 0} = \frac{-6}{6} = -1$$

a (0, 6) f(a)

b (6, 0) f(b)

Average Rate of Change Activity...

$$\frac{f(b)-f(a)}{b-a}$$

After you get it checked off, start on **Ch 3 Review** in packet!

due Thursday

Math 2A – Chapter 3 Review Name _____Hr___

1. Write the general equation of a quadratic in each of the following forms:
Standard Form: Vertex Form: Factored Form:

2. Given $y = x^2 + 2x - 3$, find the following:
a) Factored Form: b) Vertex Form:

Find vertex form if needed then: A) Identify the vertex and axis of symmetry, B) then write a verbal expression for each equation describing the transformation from the parent function.

3. $y = -(x - 7)^2 + 3$

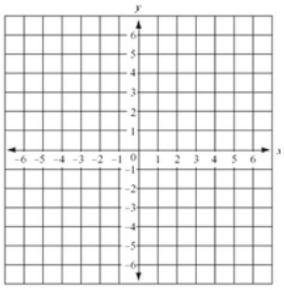
_____.

4. $y = x^2 - 5x + 4.$

_____.

Graph the functions, and then find the parts (a-d) below:

5. $f(t) = -t^2 - 6t - 5$



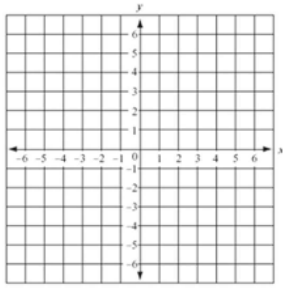
a) Vertex:

b) Axis of Symmetry:

c) x-intercept(s):

d) y-intercept:

6. $f(x) = (x + 6)(x + 1)$



a) Vertex:

b) Axis of Symmetry:

c) x-intercept(s):

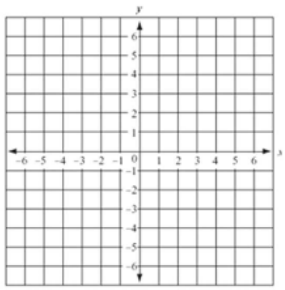
d) y-intercept:

Write the equation of a function that is described below.

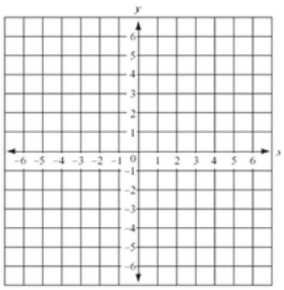
7. A quadratic function that is shifted up 5 units, shifted right 2 units and vertically compressed/shrunk by a factor of $\frac{1}{3}$.

Graph the functions and describe the transformations.

8. $y = -3(x + 3)^2 + 6$

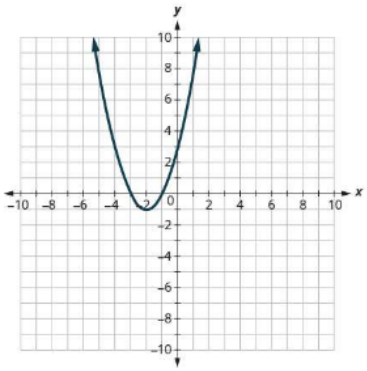


9. $= \frac{1}{4}x^2 - 2$

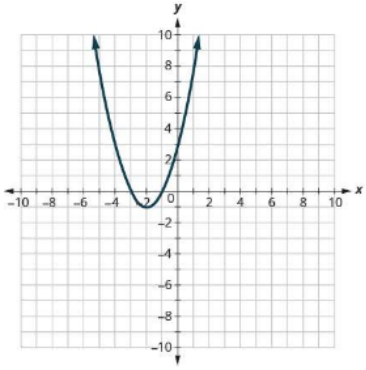


Let $h(x)$ be the function represented by the graph below.

10. Sketch the graph $-h(x-5)$

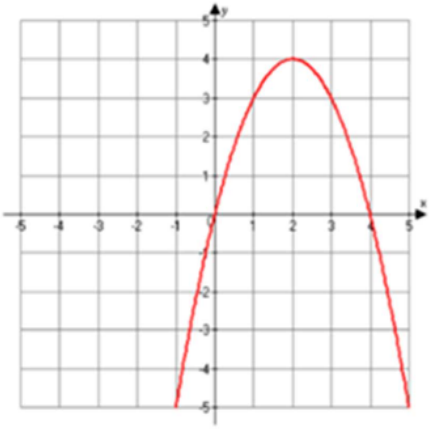


11. Sketch the graph $h(x)-4$



12. Calculate the **average rate of change** of the function $y = 3x^2 + 6x - 8$ on the interval [-2,0]

13. Using the graph below Find the following:



a) State the vertex:

b) What is the axis of symmetry:

c) Is the vertex a max or min and what is the max or min:

d) Find the equation of the quadratic:

c) State the zeros:

d) State the y-intercept:

e) State the Domain:

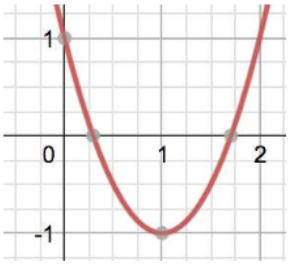
f) State the Range:

g) Find $f(1)$

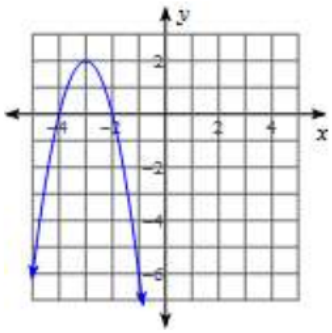
h) Find the average rate of change on the interval $[2, 4]$

Write a quadratic equation for the given graphs.

14.



15.



Write a quadratic function whose graph satisfies the given conditions.

16. x-intercepts: -5 and $\frac{2}{3}$

17. x-intercepts: 0 and 3

18. Vertex (-1, 1) and a point (2, 4)

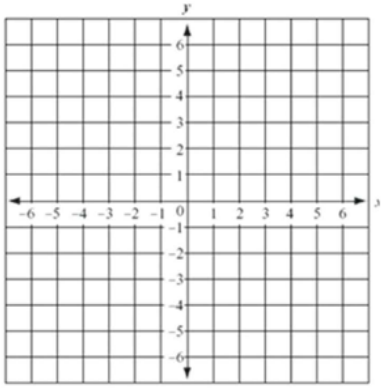
19. Vertex (-3, -1) and a point (-1, -9)

20. Given $f(x) = ax^2 + bx + c$. State a value for a that makes $f(x)$ opens down and wider than: $g(x) = 2x^2 + 5x + 3$.

Find a value for c that will make each polynomial a perfect square trinomial.

21. $x^2 + 16x + c$

22. Graph the function $f(x) = \begin{cases} 2 & if\ x < -2 \\ x^2 + 2 & if\ -2 \le x < 1 \\ 2x - 4 & if\ x \ge 1 \end{cases}$



a) $f(-2) =$

b) $f(0) =$

c) $f(4) =$

23. Write a Piece wise function for the given graph.