

Show all work! Be sure to read the directions. You are going to do great!!

1) Graph the following quadratic given the table below. Then label the following.

a) Vertex

$(0, 0)$

b) y-int

$(0, 0)$

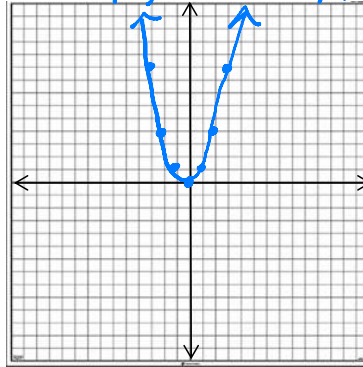
c) Max/Min

$(0, 0)$

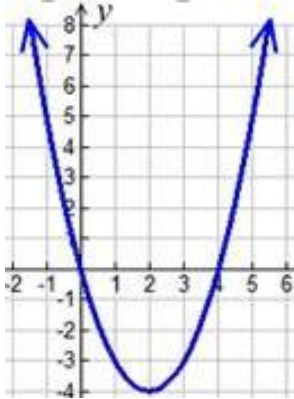
d) Axis of symmetry

$X = 0$

x	y
-3	9
-2	4
-1	1
0	0
1	1
2	4
3	9



2) For the following, list out all the characteristics provided.



Dom:  $(-\infty, \infty)$

Range:  $(-4, \infty)$

Dir: UP

Discr:  $\text{Cont}$

Vertex:  $(2, -4)$

Axis of Symm:  $X = 2$

Max/min:  $(2, -4)$

x-ints:  $(0, 0)$   
 $(4, 0)$

y-int:  $(0, 0)$

Function? YES

Incr:  $(2, \infty)$

Decr:  $(-\infty, 2)$

End Beh:  $x \rightarrow -\infty \quad y \rightarrow \infty$   
 $x \rightarrow \infty \quad y \rightarrow \infty$

3) Evaluate  $f(x) = -x^2 + 3x + 5$  for the following x values (you need to plug ALL the numbers in)

a.  $x = -2$

b.  $x = 0$

c.  $x = 2$

d.  $x = 4$

$$\begin{array}{cccc}
 -(-2)^2 + 3(-2) + 5 & -(0)^2 + 3(0) + 5 & -(2)^2 + 3(2) + 5 & -(4)^2 + 3(4) + 5 \\
 -5 & 5 & 7 & -9 - 12 + 4
 \end{array}$$

4) Which of the following make  $f(-3) = -2$  true? (plug in a -3 for x and see which one gives you -2)

~~a.  $f(x) = x^2 + 3x + 2$~~   
 $(-3)^2 + 3(-3) + 2 = 2$

b.  $f(x) = x^2 + 5x + 4$   
 $(-3)^2 + 5(-3) + 4 = -2$   
 $9 - 15 + 4$

~~c.  $f(x) = x^2 - 3x - 4$~~   
 $(-3)^2 - 3(-3) - 4 = 14$

d.  $f(x) = (x + 4)(x + 1)$   
 $(-3 + 4)(-3 + 1) = -2$

5) Consider the functions:  $f(x) = x^2 + 2$   $g(x) = 3x$   
 At what x value(s) are f(x) and g(x) the same? (Hint: make a table)

(1,3) and (2,6)

x	y
0	2
1	3
2	6
3	11
4	18
5	27

x	y
0	0
1	3
2	6
3	9
4	12
5	15

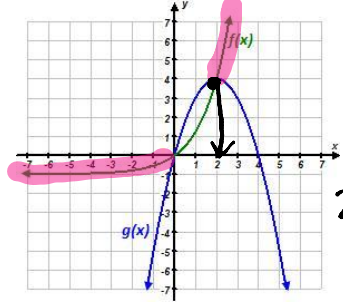
Which has a larger average rate of change (slope) from x = 3 to x = 5?

(3, 11) (5, 27)  $\frac{27-11}{5-3} = 8$

(3, 9) (5, 15)  $\frac{15-9}{5-3} = 3$

**f(x) is larger**

6) Functions f(x) and g(x) are graphed below.



For which values of x is f(x) > g(x)? → f(x) on top

- a. x < 0
- b. 0 < x < 2
- c. 0 < x < 4
- d. x < 0 or x > 2

2 opposite directions

7) For the following, find the slope from x = 5 to x = 20.

x	2	5	8	11	14	17	20
y	1	3	7	13	21	31	43

$\frac{43-3}{20-5} = \frac{40}{15} = \frac{8}{3}$

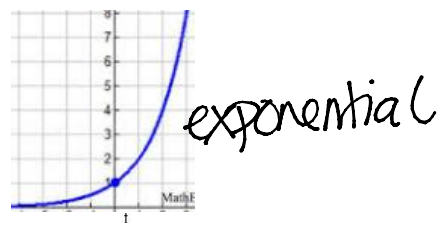
For # 8 – 11: Label the following as exponential, linear, quadratic or neither.

8) 

x	-5	-4	-3	-2	-1	0	1	2	3	4	5
y	25	16	9	4	1	0	1	4	9	16	25

 9)

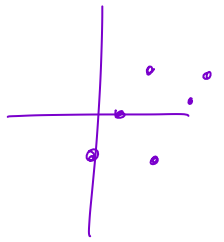
$\checkmark \checkmark \checkmark \checkmark \checkmark \checkmark \checkmark \checkmark \checkmark \checkmark \checkmark \checkmark$   
 $-9 -7 -5 -3 -1 +1$   
 $\checkmark$   
 $+2$   
**Quadratic**



10) Mrs. DeLay has 20 gray hairs and every week, she adds 12 more?

**Linear**

$y = 20 + 12x$



11) Create a table that is neither linear, exponential, nor a quadratic!

x	0	1	2	3	4	5
y	-3	0	4	-3	1	2

Multiply out the following to put them in **standard form**.

12)  $2(x-3)(x+7)$

$(2x-6)(x+7)$

$2x$	$-6$
$x$	$2x^2 - 6x$
$7$	$14x - 42$

$2x^2 + 8x - 42$

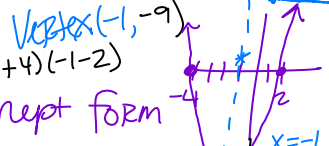
13)  $-5x(3x-8)$

$-15x^2 + 40x$

14)  $(-4x-5)(9x+2)$

$-36x^2 - 53x - 10$

$9x$	$-4x$	$-5$
$2$	$-18x$	$-10$



15) Given the following equation of a quadratic, list out all that you know.

$y = (x+4)(x-2)$

Intercept form

$(-4, 0)$   $(2, 0)$

a. x-ints:

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

c. direction:

UP

b. Standard form:

$y = x^2 + 2x - 8$

$x$	$4$
$2$	$2x$
$-8$	$-8$

e. Domain:

$(-\infty, \infty)$

c. y-int:

$(0, -8)$

f. Max/Min:

$(-1, -9)$

16) In class we have been talking about linear, exponential, and quadratic functions. I'd like you to write an explanation that explains the differences between a linear, an exponential, and a quadratic for the following:

Rate of Change:

Linear  
Slope

Quad  
Constant  
Add/subtract

Expo  
Double diff  
↕

Expo  
Multiply

Domain:

Linear  
 $(-\infty, \infty)$

Quad  
 $(-\infty, \infty)$

Expo  
 $(-\infty, \infty)$

The slope for a linear is a constant add or subtract. The slope for a quadratic is a double difference and the slope for exponential is multiplying. Exponential grows the fastest.

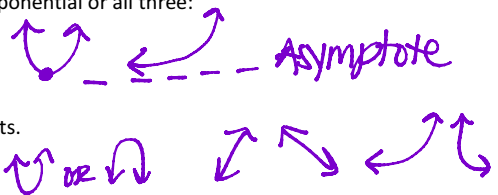
All Domains are the same, meaning you can plug in any x-value.

17) Determine if the following are Linear, Quadratic, Exponential or all three:

Linear My range is:  $(-\infty, \infty)$ .

Quadratic I can have 0, 1, or 2 x-intercepts.

Quadratic I only have one end behavior.



18) Create a graph that contains the following information:

Domain:  $(-\infty, \infty)$

Range:  $(-\infty, 4]$

Axis of Symmetry:  $x = 2$

y-intercept:  $(0, 0)$

x-intercepts:  $(0, 0)$  &  $(4, 0)$

