COMPARING FUNCTIONS NAME:_____

NAME OF FUNCTION	GENERAL SHAPE OF GRAPH	SKETCH
LINEAR		
QUADRATIC		
EXPONENTIAL		

1. Complete the following tables and answer the questions to the right.

(a)

X	y = 2x	1st Diff
-3		
-2		
-1		
0		
1		
2		
3		

This function is.

☐ linear ☐ quadratic ☐ exponential

Describe two ways you were able to determine what this function is:

(b)

x	$y = x^2$	1st Diff	2nd Diff
-3			
-2			
-1			
0			
1			
2			
3			

This function is.

☐ linear ☐ quadratic ☐ exponential

How do you know?

(c)

x	$y = 2^x$	1st Diff	2nd Diff
-3			
-2			
-1			
0			
1			
2			
3			

What do you notice about the differences in this function?

_____

By what number is the first difference multiplied by to get the next term in the sequence of y-values?

_____

How does this value connect to the function?

_____

This function is. ☐linear ☐ quadratic ☐ exponential

What methods can you use to verify the type of function selected?

2. Use differences to identify the type of function represented by the table of values. Then label which type of function each table of values models.

x	y
-4	5
-3	8
-2	13
-1	20
0	29
1	40

Function: _____

x	y
-5	32
-4	16
-3	8
-2	4
-1	2
0	1

Function: _____

x	y
-2	8
-1	4
0	2
1	1
2	.5
3	.25

Function: _____

x	y
0.5	0.9
0.75	1.1
1	1.3
1.25	1.5
1.5	1.7
1.75	1.9

Function: _____

Identify the following equations as linear, quadratic or exponential.

1. $y = 10\left(\frac{1}{3}\right)^x$

☐linear ☐ quadratic ☐ exponential

2. $y = 5 + 7(x)$

☐linear ☐ quadratic ☐ exponential

3. $y = (x+3)^2 - 4$

☐linear ☐ quadratic ☐ exponential

4. $y = -2(x) + 5$

☐linear ☐ quadratic ☐ exponential

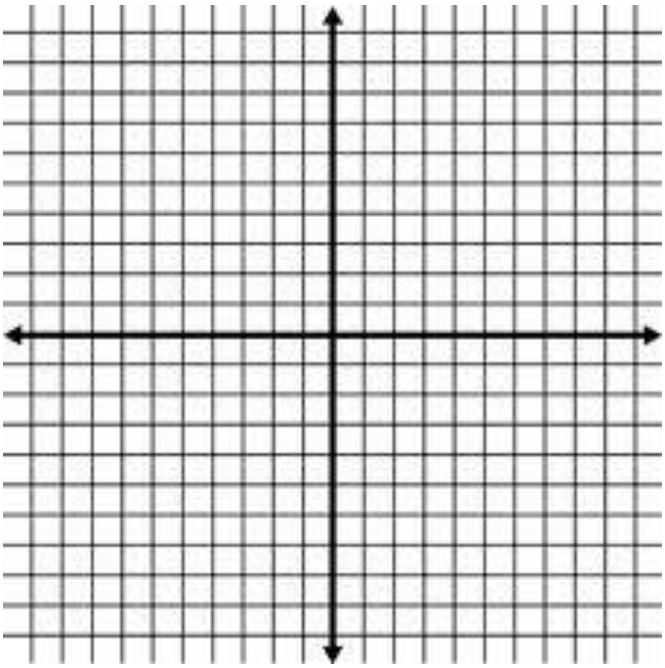
5. $y = -\frac{1}{2}(3)^x$

☐linear ☐ quadratic ☐ exponential

6. $y = \frac{1}{3}(x)^2 - 4$

☐linear ☐ quadratic ☐ exponential

Graph the functions $y = 2x$, $y = x^2$ and $y = 2^x$ on the same grid for**. Label your graphs.**



Looking at the graphs above:

a) Which function equation shows a constant rate of change in its y values?
How is this displayed on your graph?

b) For $x < 4$ which function shows the fastest rate of change in its y values? (Look at table)
How is this displayed on your graph?

c) Eventually, which type of function shows the most rapid rate of growth in its y values?
How is this displayed on your graph?

Practice Problems

Identify the following equations as linear, quadratic or exponential.

1. $y = 4^x + 6$

2. $y = -\frac{3}{2}x - 3$

3. $y = x^2 - 5x + 6$

4. $y = -2(4)^x$

5. $y = 3x + 3$

6. $f(x) = (x - 2)^2 + 7$