Name:_____ Date:_____

UNIT 10 **LESSON 2**

AIM: USING A TABLE OF VALUES TO IDENTIFY A FUNCTION

Example # 1: Linear **Function**

Rule: Both the x and y-values increase by a common difference **(constant).** Arithmetic

Equation: $y = ax + b$

$y = 3x + 1$

x	y
0	1
1	4
2	7
3	10
4	13
5	16

→ y-int

+3, +3, +3, +3, +3

$a_2 - a_1 = d$

$4 - 1 = d$

$3 = d$

Example # 2: Exponential **Function**

Rule: The y-value increases by a common ratio **(factor).** Geometric

Equation: $y = ab^x$

$y = 1(2)^x$

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

→ y-int

·2, ·2, ·2, ·2, ·2

$a_2 \div a_1 = r$

$2 \div 1 = r$

$2 = r$

Example # 3: Quadratic **Function**

Rule: The 2nd Set **of differences of the y-values has a common difference (constant).**

Equation: $y = ax^2 + bx + c$

$y = 2x^2 + 4x - 1$

x	y
0	-1
1	5
2	15
3	29
4	47
5	69

+6, +10, +14, +18, +22

+4, +4, +4, +4

Example #4: Absolute **Function**

Rule: The y-value increases by a positive **and** negative **common difference**

vertex →

x	$f(x)$	
-3	1.5	-.5
-2	1	-.5
-1	0.5	-.5
0	0	+.5
1	0.5	+.5
2	1	+.5
3	1.5	

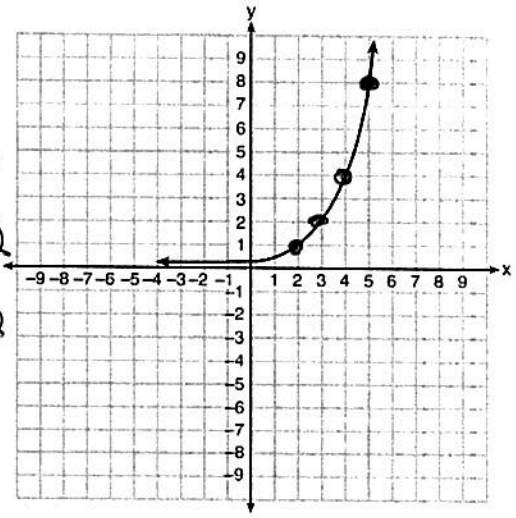
1. Write an exponential equation for the graph shown below. Explain how you determined the equation.

$y = ab^x$

$a = .25$ $\quad y = .25(2)^x$

$b = 2$

X	Y	
2	1	
3	2	·2
4	4	·2
5	8	·2



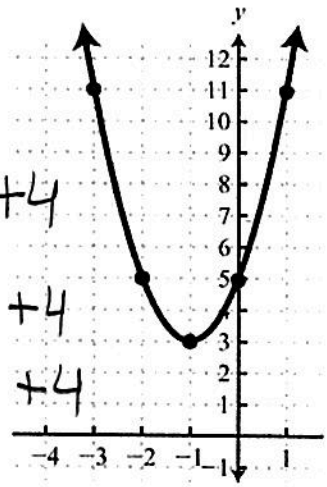
parabola

2. Write a quadratic equation for the graph shown below. Explain how you determined the equation.

$y = ax^2 + bx + c$

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

X	Y		
-3	11		
-2	5	-6	+4
-1	3	-2	+4
0	5	+2	+4
1	11	+6	



3. Match each table below to the function and the context, and explain how you made your decision.

A

x	y
1	9
2	18
3	27
4	18
5	9

Equation $h(x)$

Context 5

B

x	y
1	12
2	24
3	36
4	48
5	60

Equation $f(x)$

Context 4

C

x	y
0	160
1	174
2	156
3	106
4	24

Equation $q(x)$

Context 2

D

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

Equation $p(x)$

Context 1

E

x	y
2	8
3	9
4	8
5	5
6	0

Equation $g(x)$

Context 3

Equations:	**Contexts:**
$f(x) = 12x$	**1.** The population of bacteria doubled every month, and the total population vs. time was recorded.
$h(x) = -9\|x - 3\| + 27$	**2.** A ball was launched upward from the top of a building, and the vertical distance of the ball from the ground vs. time was recorded.
$g(x) = -(x)(x - 6)$	**3.** The height of a certain animal's vertical leap was recorded at regular time intervals of one second; the animal returned to ground level after six seconds.
$p(x) = 2^x$	**4.** Melvin saves the same amount of money every month. The total amount saved after each month was recorded.
$q(x) = -16x^2 + 30x + 160$	**5.** Chris ran at a constant rate on a straight-line path and then returned at the same rate. His distance from his starting point was recorded at regular time intervals.