

Name Teacher

Pd \_\_\_\_\_ Date \_\_\_\_\_

Section 1.E.2 - Common Types of Functions

Vocabulary Quadratic Function

Function Rule

$f(x) = ax^2 + bx + c$

Key Feature: highest exponent on the variable is 2

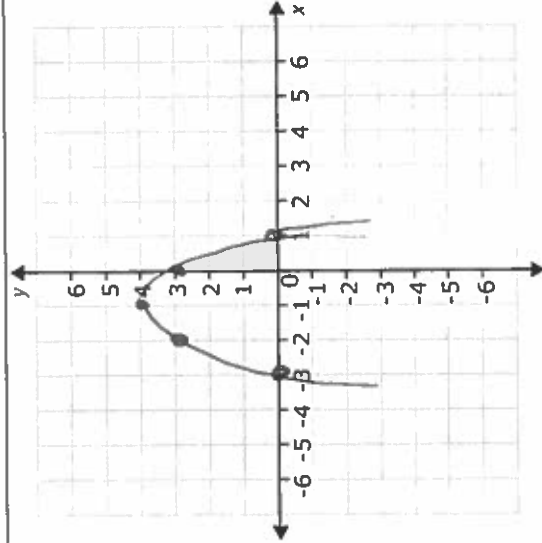
Table

x	$-x^2 - 2x + 3$	f(x)	(x,y)
-3	$-(-3)^2 - 2(-3) + 3$	0	(-3,0)
-2	$-(-2)^2 - 2(-2) + 3$	3	(-2,3)
-1	$-(-1)^2 - 2(-1) + 3$	4	(-1,4)
0	$-(0)^2 - 2(0) + 3$	3	(0,3)
1	$-(1)^2 - 2(1) + 3$	0	(1,0)

What do you notice?

- outputs repeat
- outputs rise then fall

Graph



What do you notice?

- looks like upside down "U"
- parabola
- smooth curve

Exponential Function

$f(x) = a^x$

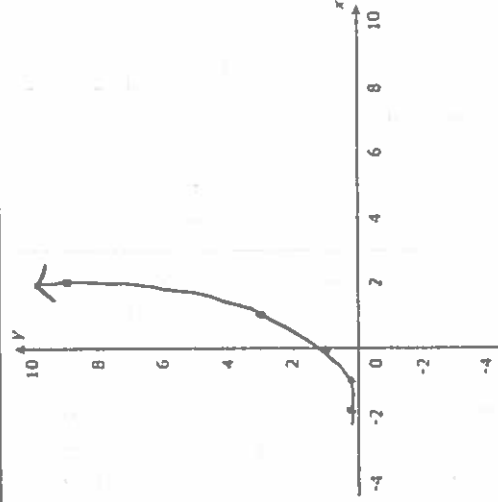
Key Feature: the variable is the exponent

x	$3^x$	f(x)	(x,y)
-2	$\frac{1}{3^2} = \frac{1}{9}$	$\frac{1}{9}$	(-2, $\frac{1}{9}$ )
-1	$\frac{1}{3^1} = \frac{1}{3}$	$\frac{1}{3}$	(-1, $\frac{1}{3}$ )
0	$3^0 = 1$	1	(0,1)
1	$3^1 = 3$	3	(1,3)
2	$3^2 = 9$	9	(2,9)

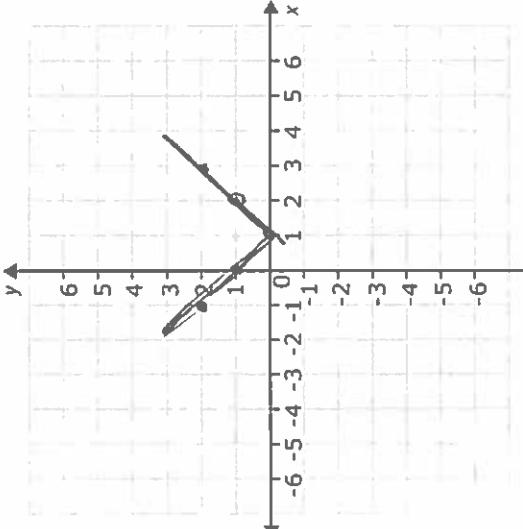
What do you notice?

- outputs go really small to big
- pattern of the outputs is multiply by 3

What do you notice?



- shooting off
- smooth curve

Vocabulary	Absolute Value Function	Linear Function																																																
<b>Function Rule</b>	$f(x) =  x $ Key Feature: absolute value bars	$f(x) = mx + b$ Key Feature: highest exponent on $x$ is 1 m: slope    b: y-intercept																																																
<b>Table</b>	<table border="1" data-bbox="373 1029 698 1795"> <thead> <tr> <th>x</th> <th><math> x-1 </math></th> <th>f(x)</th> <th>(x,y)</th> </tr> </thead> <tbody> <tr> <td>-1</td> <td><math> -1-1  =  -2  = 2</math></td> <td>2</td> <td>(-1, 2)</td> </tr> <tr> <td>0</td> <td><math> 0-1  =  -1  = 1</math></td> <td>1</td> <td>(0, 1)</td> </tr> <tr> <td>1</td> <td><math> 1-1  =  0  = 0</math></td> <td>0</td> <td>(1, 0)</td> </tr> <tr> <td>2</td> <td><math> 2-1  =  1  = 1</math></td> <td>1</td> <td>(2, 1)</td> </tr> <tr> <td>3</td> <td><math> 3-1  =  2  = 2</math></td> <td>2</td> <td>(3, 2)</td> </tr> </tbody> </table> <p>What do you notice?            • outputs repeat            • outputs fall then rise</p>	x	$ x-1 $	f(x)	(x,y)	-1	$ -1-1  =  -2  = 2$	2	(-1, 2)	0	$ 0-1  =  -1  = 1$	1	(0, 1)	1	$ 1-1  =  0  = 0$	0	(1, 0)	2	$ 2-1  =  1  = 1$	1	(2, 1)	3	$ 3-1  =  2  = 2$	2	(3, 2)	<table border="1" data-bbox="373 136 698 934"> <thead> <tr> <th>x</th> <th><math>2x-4</math></th> <th>f(x)</th> <th>(x,y)</th> </tr> </thead> <tbody> <tr> <td>-1</td> <td><math>2(-1)-4 = -2-4 = -6</math></td> <td>-6</td> <td>(-1, -6)</td> </tr> <tr> <td>0</td> <td><math>2(0)-4 = 0-4 = -4</math></td> <td>-4</td> <td>(0, -4)</td> </tr> <tr> <td>1</td> <td><math>2(1)-4 = 2-4 = -2</math></td> <td>-2</td> <td>(1, -2)</td> </tr> <tr> <td>2</td> <td><math>2(2)-4 = 4-4 = 0</math></td> <td>0</td> <td>(2, 0)</td> </tr> <tr> <td>3</td> <td><math>2(3)-4 = 6-4 = 2</math></td> <td>2</td> <td>(3, 2)</td> </tr> </tbody> </table> <p>What do you notice?            • pattern of the outputs is add 2</p>	x	$2x-4$	f(x)	(x,y)	-1	$2(-1)-4 = -2-4 = -6$	-6	(-1, -6)	0	$2(0)-4 = 0-4 = -4$	-4	(0, -4)	1	$2(1)-4 = 2-4 = -2$	-2	(1, -2)	2	$2(2)-4 = 4-4 = 0$	0	(2, 0)	3	$2(3)-4 = 6-4 = 2$	2	(3, 2)
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<b>Graph</b>	<p>What do you notice?</p> <ul style="list-style-type: none"> <li>looks like a "V" shape</li> <li>sharp turn</li> </ul> 	<p>What do you notice?</p> <ul style="list-style-type: none"> <li>straight line</li> <li>crosses y-axis @ (0, -4) which is b</li> </ul> 