Inspiring Greatness

ISD

INDEPENDENCE SCHOOL DISTRICT

Math Virtual Learning

Algebra 1 S2

April 13th, 2020

Algebra 1 S2

Lesson: April 13th, 2020

Learning Target:

Students will identify a quadratic function from a graph, equation and table

Part 1

Let's Warm-Up!

Identify the Key Features of the function:

$y = 2x^2 - 16x + 33$

Open Up or Down?

Vertex:(,)

Max or Min?

Axis of Symmetry: x = ____

Domain: ____ ≤ x ≤ ____

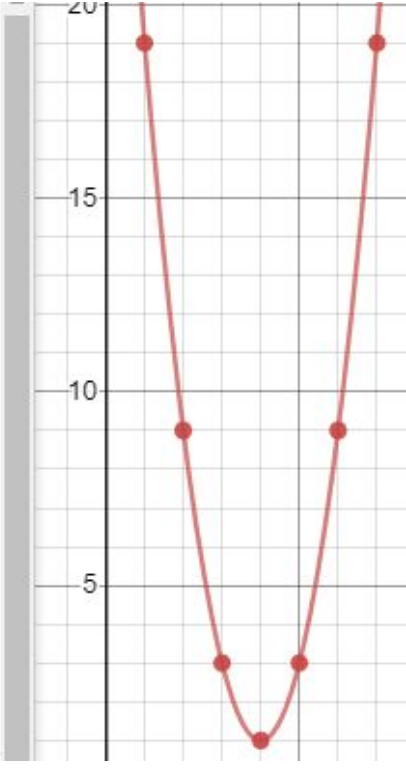
Range: ____ ≤ y ≤ ____

End Behavior:

- As $x \to -\infty$, $y \to$ ____
- As $x \to \infty$, $y \to$ ____

Zeros/X-intercepts:

x	$2x^2 - 16x + 3$
0	33
1	19
2	9
3	3
4	1
5	3
6	9
7	19
8	33



Answers to the Warm-Up:

Identify the Key Features of the function:

$y = 2x^2 - 16x + 33$

Open Up or Down

Vertex:(4 , 1)

Max or Min?

Axis of Symmetry: x = 4

Domain: $-\infty \leq x \leq \infty$

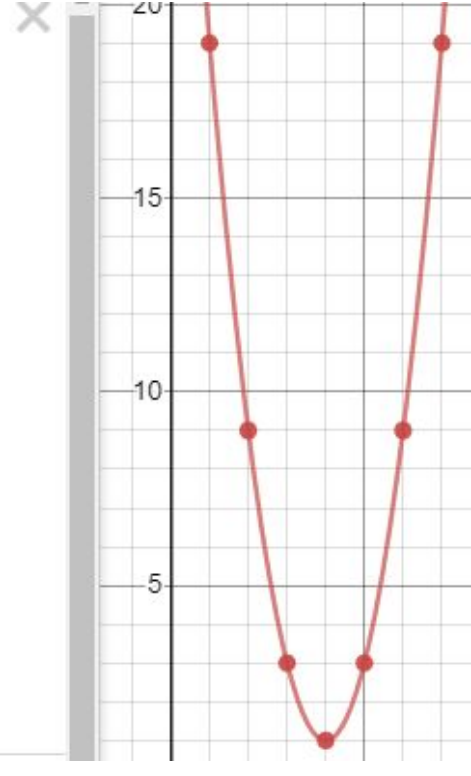
Range: $1 \leq y \leq \infty$

End Behavior:

- As $x \rightarrow -\infty$, $y \rightarrow \infty$
- As $x \rightarrow \infty$, $y \rightarrow \infty$

Zeros/X-intercepts: None

x	$2x^2 - 16x + 3$
0	33
1	19
2	9
3	3
4	1
5	3
6	9
7	19
8	33



Warm-Up Continued!

Go to the link below and complete the practice of identifying parts of a quadratic function by looking at the graph.

Review Activity

*Challenge:-Get as many in a row as you can
-Set a time limit for yourself

Video Lesson

Quadratic or Not? Watch the video to learn how to identify if a graph, equation or table is quadratic.

Practice #1

Determine if each table represents a quadratic relationship or not

a)

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

b)

x	y
-2	4
-1	2
0	1
1	0.5
2	0.25

Practice #1 Answer

Determine if each table represents a quadratic relationship or not

a) Quadratic

x	y	
-5	0	decreasing
-4	-3	
-3	-4	minimum
-2	-3	increasing
-1	0	

b) Not Quadratic (this is exponential!)

x	y	
-2	4	$\cdot \frac{1}{2}$
-1	2	$\cdot \frac{1}{2}$
0	1	$\cdot \frac{1}{2}$
1	0.5	$\cdot \frac{1}{2}$
2	0.25	

only decreases

Practice #2

Determine if each table represents a quadratic relationship or not

c)

x	y
-2	9
-1	5
0	1
1	-3
2	-7

d)

x	y
-1	-8
0	-3
1	0
2	1
3	0

Practice #2 Answer

Determine if each table represents a quadratic relationship or not

c) Not Quadratic (Linear)

x	y	
−2	9	
		−4
−1	5	
		−4
0	1	
		−4
1	−3	
		−4
2	−7	

constant difference

only decreases

d) Quadratic

x	y	
−1	−8	increasing
0	−3	
1	0	
2	1	maximum
3	0	decreasing
4	−3	

Practice #3

Select all equations below that are quadratic. Go to www.desmos.com and graph each one.

a) $y = x^3$

b) $y = -x^2$

c) $y = 5^x$

d) $y = 4x^2 - 2x - 3$

e) $y = 1.5x - 7$

Practice #3 Answer

Select all equations below that are quadratic. Go to www.desmos.com and graph each one.

a) $y = x^3$ cubic

b) $y = -x^2$ quadratic

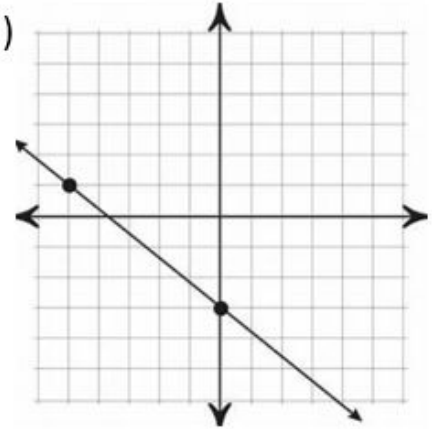
c) $y = 5^x$ exponential

d) $y = 4x^2 - 2x - 3$ quadratic

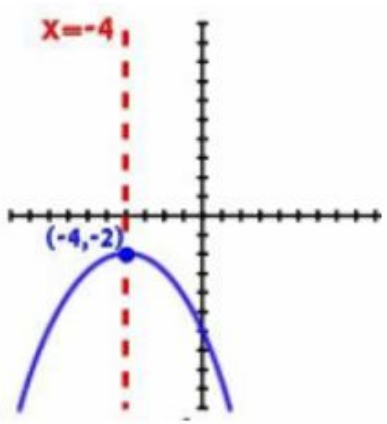
e) $y = 1.5x - 7$ linear

Practice #4 *Select all* graphs below that are quadratic.

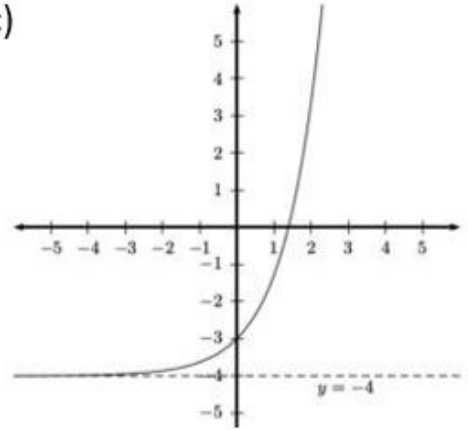
a)



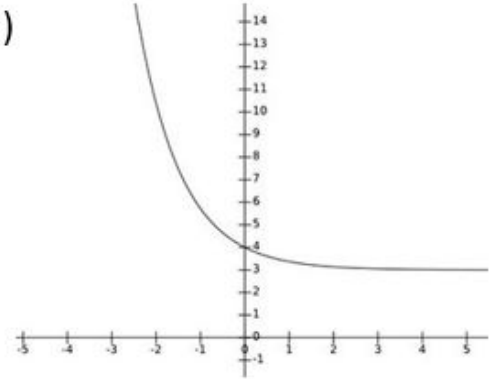
b)



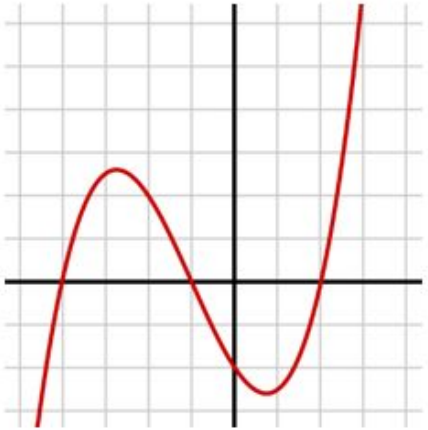
c)



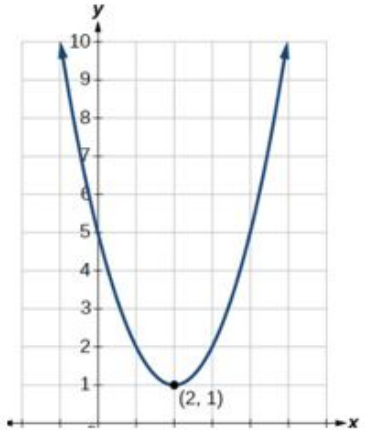
d)



e)

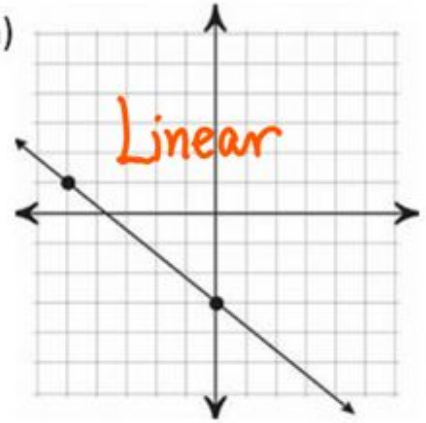


f)

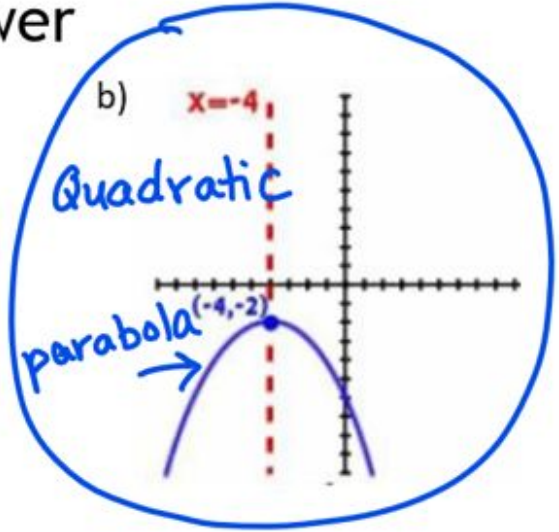


Practice #4 Answer

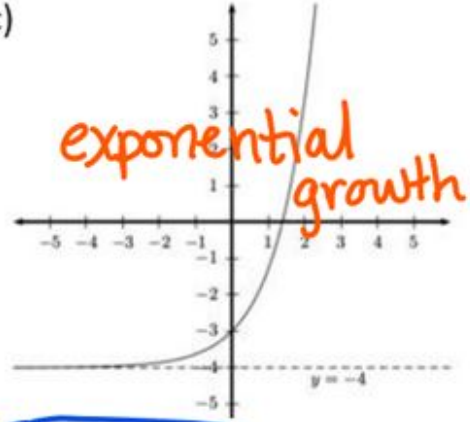
a)



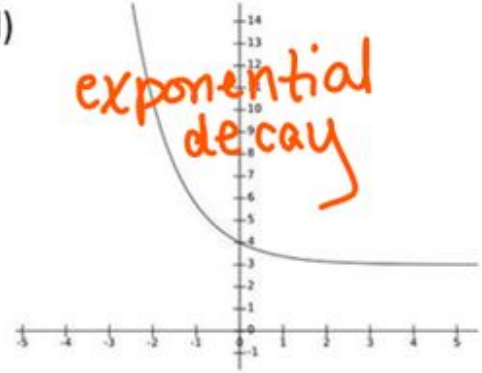
b)



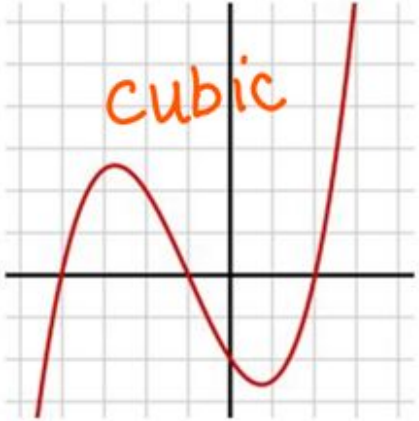
c)



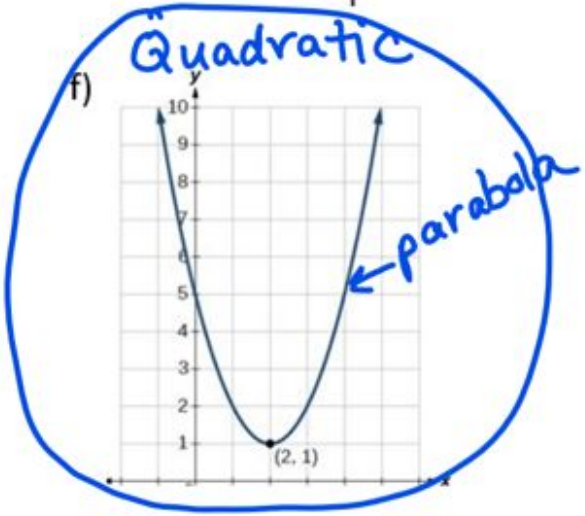
d)



e)



f)



Practice #5 Determine if each statement about quadratics is true or false.

a. A quadratic is a parabola, or U-shaped, graph. _____
b. A quadratic increases or decreases, but does not do both. _____
c. Every quadratic has a maximum. _____
d. Every quadratic has a vertex. _____
e. Every quadratic has a vertical line of symmetry. _____
f. Every quadratic has a horizontal line of symmetry. _____
g. A quadratic represents a function that is repeatedly multiplying by the same number. _____
h. A quadratic represents a function with a constant rate. _____

Practice #5 Answers: Determine if each statement about quadratics is true or false.

a. A quadratic is a parabola, or U-shaped, graph. *True*
b. A quadratic increases or decreases, but does not do both. *False*
c. Every quadratic has a maximum. *False, it could have a minimum.*
d. Every quadratic has a vertex. *True*
e. Every quadratic has a vertical line of symmetry. *True*
f. Every quadratic has a horizontal line of symmetry. *False, never*
g. A quadratic represents a function that is repeatedly multiplying by the same number. *False, an exponential function has a repeated multiplier*
h. A quadratic represents a function with a constant rate. *False, a linear function has a constant rate*

Independent Practice

Use your notes from today to practice with this activity on identifying whether the function is linear, exponential or quadratic.

Practice Link

Additional Practice:

Click on the links below to get additional practice and to check your understanding!

Extra Practice

-Don't forget that a function has to pass the vertical line test (Pencil Test)

Key