

Math Virtual Learning

Algebra 2A Polynomial Parent Functions

May 6, 2020



Lesson: Sketching Polynomial Parent Functions

Learning Target:

LT C1 I can create a sketch of a polynomial function from an equation and create a polynomial equation from a graph.

Objective:

Students will be able to create an equations from a graph.

Warm Up

List the transformations of the functions.

1.
$$y = 6(x - 8)^3 - 5$$

2. $y = 2x^4 + 12$
3. $y = (x + 9)^2 - 8$
4. $y = \frac{1}{2}(x - 11)^3 + 6$

Warm Up Answers

- 1. Dilation 6, Right 8, down 5
- 2. Dilation 2, up 12
- 3. Left 9, down 8
- 4. Dilation of $\frac{1}{2}$, right 11, up 6



For today, we will continue to work with graphing transformations of polynomial functions. Watch the video below for a review of yesterday's topic.

https://www.youtube.com/watch?v=MkP1LJR2PyM

Lesson

To graph a transformation, first identify the transformations of a, b, h, and k and then use the table below to find the vertex and two points on the graph.

Parent	Parent Function		Transformation	
f(x)	$f(x) = x^n$		$f(x) = a(\frac{1}{b}(x-h))^n + k$	
x	у	x	у	
-1	(-1) ⁿ	(-1)b + h	$(-1)^n a + k$	
0	0	h	k	
1	1	b + h	a + k	

Practice

For each of the following, list the parent function, the transformations, and then graph the function.

1.
$$y = (x + 3)^3 - 5$$

2. $y = 2x^5 + 4$
3. $y = x^2 + 3$
4. $y = \frac{1}{3}(x - 4)^4 + 6$

1.
$$y = (x + 3)^{3} - 5$$

Parent: x^{3}
 $a = 1 \quad h = -3$
 $b = 1 \quad k = -5$
 $(-1)b + h^{=}(-1)(1) + (-3) = -4$
 $h = -3$
 $b + h = (1) + (-3) = -3$
 $a + k = (1) + (-5) = -4$

2.
$$y = 2x^{5} + 4$$

Resent: x^{5}
 $a = 2$ $h = 0$
 $b = 1$ $k = 4$
 $(-1)^{n}a + k = (-1)^{5}(2) + 4 = 2$
 $k = 4$
 $a = 4$
 $a + k = 2 + 4 = 6$



4. $y = \frac{1}{3}(x-4)^4 + 6$			
Parent: X4	8		
$a=\frac{1}{3}$ h=4	4		
b=1 $k=G$	5		
×			
(-1)b+h=(-1)(1)+4=3	$(-1)^{n}a+k=(-1)^{4}(\frac{1}{3})+6=6\frac{1}{3}$		
h = 4	k = 6		
b+h = 1+4=5	$a+k=\frac{1}{3}+6=6\frac{1}{3}$		

Use the two links below for additional practice in graphing functions.

https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:quadratic-functions/x2f8bb11595b61c86:vertex-form/e/graphing_parabolas_1

https://www.eatoncommunityschools.org/userfiles/23/Classes/5310/graphs%20of %20parabolas%20-%20vertex%20form.pdf?id=15574