

4.1: Exploring Polynomials



Upcoming Assessments:

- 4.1-4.4 Quiz- 11/3
- Unit 4 Test- 11/11

Homework: 4.1 Worksheet

Target(s): I can...

- identify polynomials by degree and number of terms.
- understand how the leading coefficient and the degree affect the end behavior.
- determine the maximum number of turns and zeros.
- determine the domain and range of a function.

Review from Summer Packet:

Degree of a Polynomial: the greatest degree of any term in a polynomial

- degree 0- constant
- degree 1- linear
- degree 2- quadratic
- degree 3- cubic
- degree 4- quartic
- degree 5- quintic
- degree 6- 6th degree polynomial
- degree n- nth degree polynomial

Review from Summer Packet:

Number of Terms in a Polynomial:

- 1 term- monomial
- 2 terms- binomial
- 3 terms- trinomial
- 4 terms- 4 term polynomial
- n terms- n term polynomial

Example 1:

Identify each expression as a polynomial or not a polynomial. For each polynomial, give the degree and identify the number of terms.

1. $-5x^{11}$

11th degree monomial

2. $9y^{12} + y^2$

12th degree binomial

3. $18p^5q + 6pq$

6th degree binomial

4. $-5\sqrt{z} + 2\sqrt{z^3} - 5\sqrt{z^5}$

not a polynomial

End Behavior of Graphs of Polynomial Functions:

Graph the Following Functions on Desmos:

$$y = x^3$$

$$y = x^5$$

$$y = x^7$$

What do you notice?

- odd degrees

End Behavior of Graphs of Polynomial Functions:

Graph the Following Functions on Desmos:

$$y = x^2$$

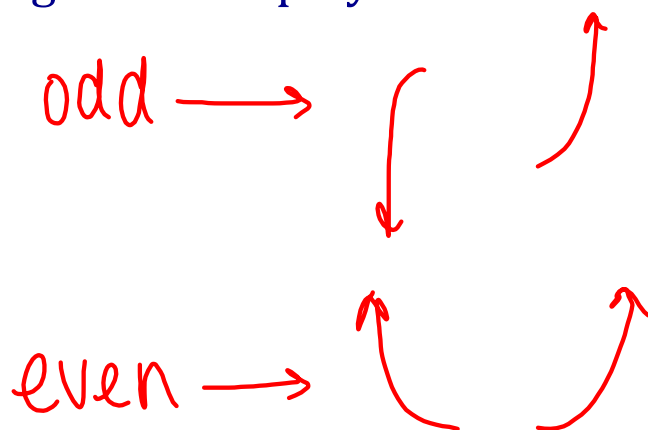
$$y = x^4$$

$$y = x^6$$

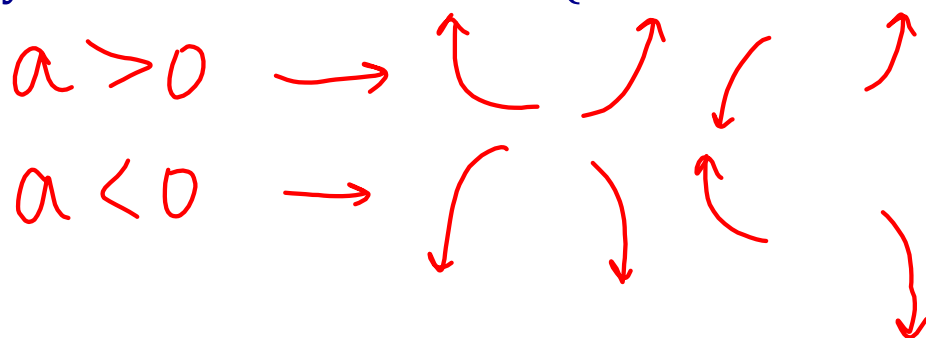
What do you notice?

- even degrees

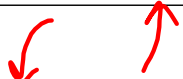
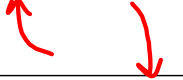

What conclusions can you draw in terms of the degree of the polynomial and end behavior?



How does an a value other than 1 affect a polynomial's end behavior? (Test on Desmos)



End Behavior of Graphs of Polynomial Functions:

Degree	A Value	$x \rightarrow -\infty$	$x \rightarrow \infty$	
odd	positive	$f(x) \rightarrow -\infty$	$f(x) \rightarrow \infty$	
odd	negative	$f(x) \rightarrow \infty$	$f(x) \rightarrow -\infty$	
even	positive	$f(x) \rightarrow \infty$	$f(x) \rightarrow \infty$	
even	negative	$f(x) \rightarrow -\infty$	$f(x) \rightarrow -\infty$	