

Objective: to use end behavior to create sketches of graphs.

Warm Up:

1. Write $f(x) = 6x^2 - 13x - 5$ in factored form. What does factored form help you solve for?

2. Write $f(x) = x^3 + 6x^2 - x - 30$ in factored form. What does factored form help you solve for?

3. Identify all of the x-intercepts for #1 & #2. Explain what the x-intercepts represent for a polynomial.

Enter the class code **6B4MZJ** at www.student.desmos.com to explore a trend of what the following polynomials look like. Your task is to find a pattern, or shortcut, in determining a general shape for the polynomials.

CHARACTERISTICS OF POLYNOMIALS		2 nd degree	3 rd degree	4 th degree	5 th degree	6 th degree
Possible Number of X-intercepts						
General Shape of Polynomial	Positive Leading Coefficient	$y = 2x^2 + x - 1$				
	End Behavior	$x \rightarrow \infty, f(x) \rightarrow$ $x \rightarrow -\infty, f(x) \rightarrow$				
	Negative Leading Coefficient	$y = -3x^2 - 2x + 4$				
	End Behavior	$x \rightarrow \infty, f(x) \rightarrow$ $x \rightarrow -\infty, f(x) \rightarrow$				
Maximum # of Turns						

Follow up:

➤ Make at least two generalizations from the data you collected above

1.

2.

➤ Make a prediction about the general shape of the following two polynomials without looking at a device. After your prediction, confirm with a device that your prediction holds true.

1. $f(x) = -x^7 + x^3 - 4$

2. $f(x) = x^8 + 2$

Let's Practice!

1. Briefly sketch what the following functions could look like. Be sure to identify the degree and leading coefficient first!

A.) $f(x) = x^3 + 4x^2 - 3$

B.) $f(x) = -x^6 + 2$

Degree:

Degree:

Sign of Leading Coefficient:

Sign of Leading Coefficient:

Sketch:

Sketch:

C.) $f(x) = x + x^4 - 3$

D.) $f(x) = 3x + 5 - 2x^2$

Degree:

Degree:

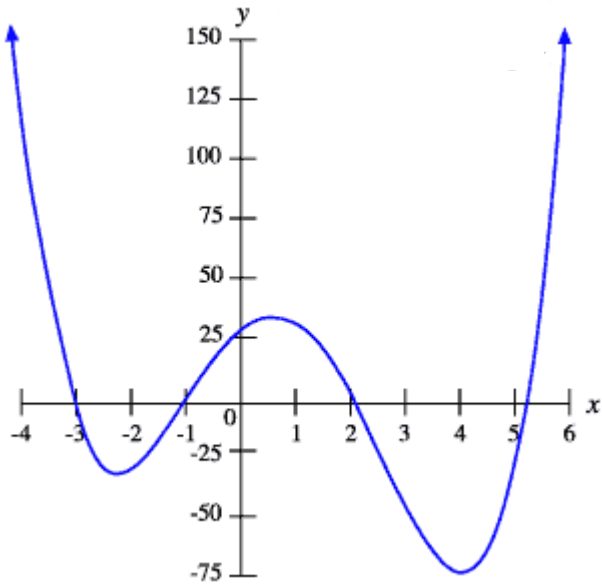
Sign of Leading Coefficient:

Sign of Leading Coefficient:

Sketch:

Sketch:

Example 1: Identify the following about the polynomial graphed below.

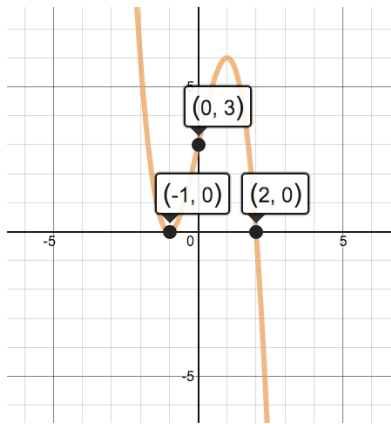


- Describe the end behavior.
- Leading Coefficient's Sign
- Degree of Function
- X-intercepts
- Factors

Let's Practice!

First write the polynomial in factored form. Then describe the end behavior using limit notation!

A.)



End Behavior:

Leading Coefficient Sign:

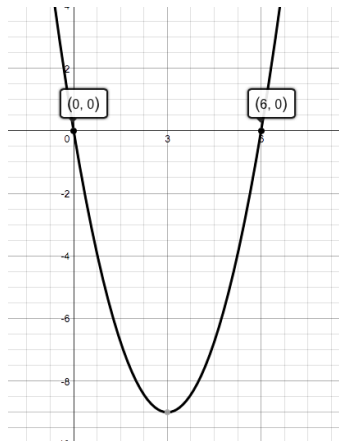
Degree of Function:

X-intercepts:

Factors:

Possible Equation:

B.)



End Behavior:

Leading Coefficient Sign:

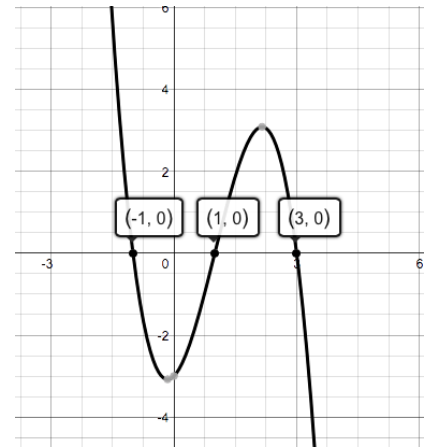
Degree of Function:

X-intercepts:

Factors:

Possible Equation:

C.)



End Behavior:

Leading Coefficient Sign:

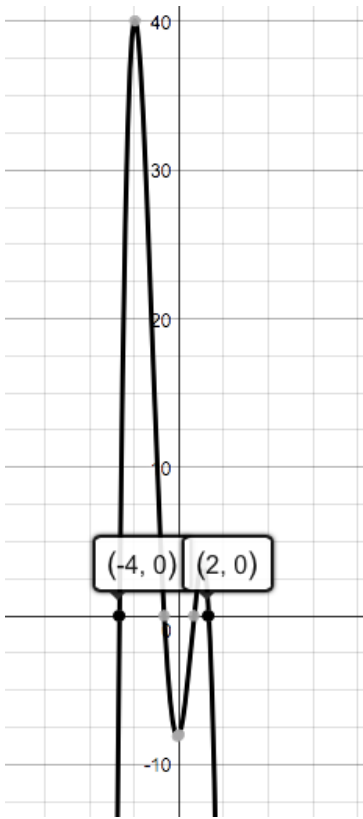
Degree of Function:

X-intercepts:

Factors:

Possible Equation:

D.)



End Behavior:

Leading Coefficient Sign:

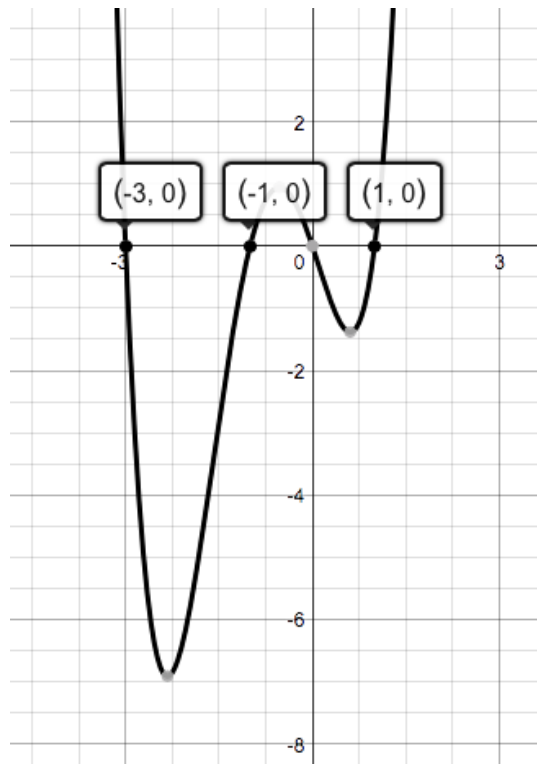
Degree of Function:

X-intercepts:

Factors:

Possible Equation:

E.)



End Behavior:

Leading Coefficient Sign:

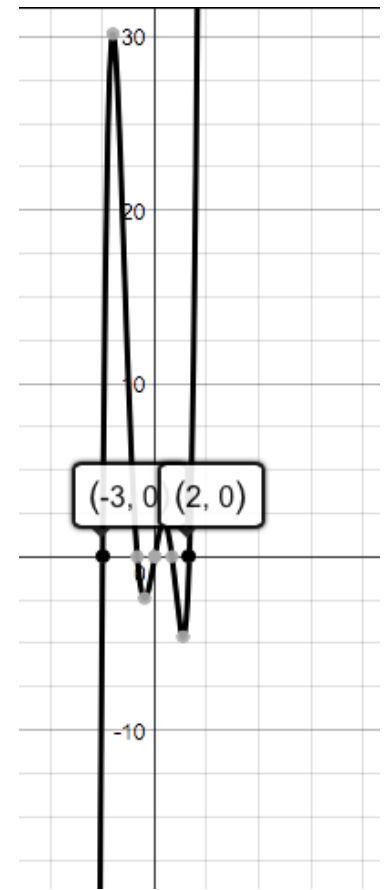
Degree of Function:

X-intercepts:

Factors:

Possible Equation:

F.)



End Behavior:

Leading Coefficient Sign:

Degree of Function:

X-intercepts:

Factors:

Possible Equation: