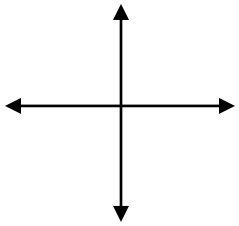
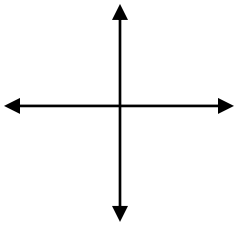
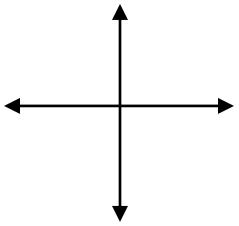
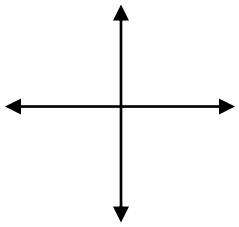
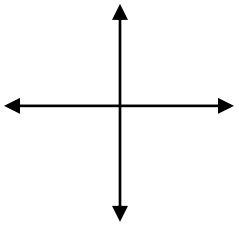
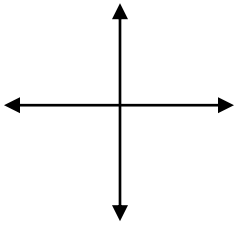
Name Period: Date:

Math Lab: Investigating End Behavior in Polynomials

Question: What can the degree and leading coefficient of a polynomial tell you about its graph?

Use a graphing calculator to make a rough sketch of each polynomial. For each, give the degree and sign of the leading coefficient.

$y = x^2 - 3x - 1$  Degree: Sign of LC:	$y = x^4 - 4x^2 + 2$  Degree: Sign of LC:	$y = x^6 - 4x^4 + 2x^2 + 6$  Degree: Sign of LC:
$y = 2x - 3$  Degree: Sign of LC:	$y = x^3 - 2x + 2$  Degree: Sign of LC:	$y = x^5 - 3x^3 + 2x - 1$  Degree: Sign of LC:

1. Describe the end behavior of the graph of a polynomial with an **EVEN DEGREE** and **POSITIVE LEADING COEFFICIENT**.

   As x approaches negative infinity, y _____.

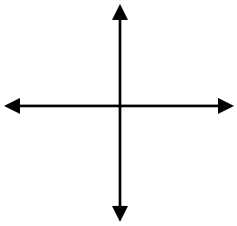
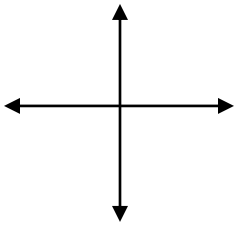
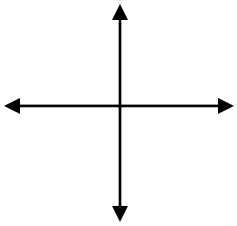
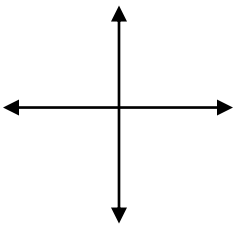
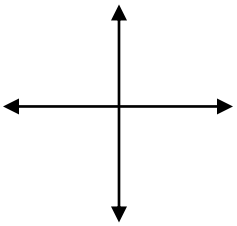
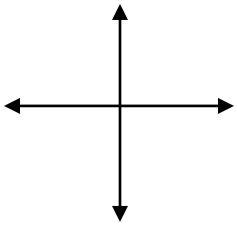
   As x approaches positive infinity, y _____.

2. Describe the end behavior of the graph of a polynomial with an **ODD DEGREE** and **POSITIVE LEADING COEFFICIENT**.

   As x approaches negative infinity, y _____.

   As x approaches positive infinity, y _____.

Use a graphing calculator to make a rough sketch of each polynomial.

$y = -x^2 + 3x + 1$  Degree: Sign of LC:	$y = -x^4 + 4x^2 - 2$  Degree: Sign of LC:	$y = -x^6 + 4x^4 - 2x^2 - 6$  Degree: Sign of LC:
$y = -2x + 3$  Degree: Sign of LC:	$y = -x^3 + 2x - 2$  Degree: Sign of LC:	$y = -x^5 + 3x^3 - 2x + 1$  Degree: Sign of LC:

3. Describe the end behavior of the graph of a polynomial with an **EVEN DEGREE** and **NEGATIVE LEADING COEFFICIENT**.

As x approaches negative infinity, y _____.

As x approaches positive infinity, y _____.

4. Describe the end behavior of the graph of a polynomial with an **ODD DEGREE** and **NEGATIVE LEADING COEFFICIENT**.

As x approaches negative infinity, y _____.

As x approaches positive infinity, y _____.