

## Polynomials:

### End Behavior and Limits to Infinity

Standard Form -  $y = a_n x^n + a_{n-1} x^{n-1} + a_{n-2} x^{n-2} + \dots + a_0$

This station will focus on the end behavior of the graphs of polynomial functions and using limit notation to describe it. To understand polynomial end behavior, we must focus on the following:

- **Degree (n):** The degree of a polynomial is the **largest exponent** of its terms. When written in standard form, it will be the degree of the first term.
- **Lead Coefficient ( $a_n$ ):** The leading coefficient is the coefficient of the term with the largest exponent. It will be the first coefficient when written in standard form.
  - **Example:**  $y = 2x^3 - 5x + 3x^4 - 6x^2 - 1 \rightarrow y = 3x^4 + 2x^3 - 6x^2 - 5x - 1$
- For polynomials with an **even degree**, both sides will behave symmetrically (rising left and rising right or falling left and falling right).
- For polynomials with an **odd degree**, both sides will behave oppositely (falling left and rising right or rising left and falling right).

