

End Behavior of a Polynomial

the behavior of a polynomial, $f(x)$, as x approaches positive infinity and as x approaches negative infinity.

As x approaches positive infinity and as x approaches negative infinity the graph of the polynomial

$$f(x) = a_n x^n + a_{n-1} x^{n-1} + \dots + a_1 x + a_0$$

resembles the graph of the power function

$$y = a_n x^n$$

End Behavior of a Polynomial

the behavior of a polynomial, $f(x)$, as x approaches positive infinity and as x approaches negative infinity.

$$f(x) = 4x^3 + 2x^2 - x + 13$$

resembles the graph of the power function

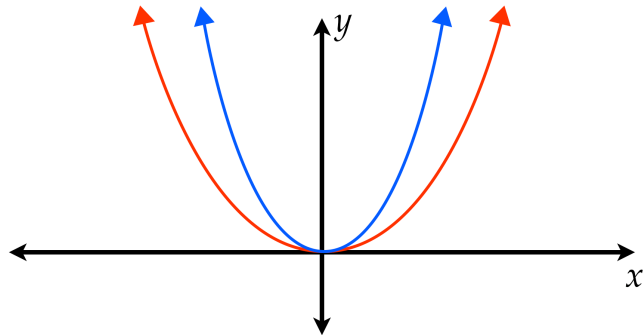
$$f(x) = -x^2 + x - 8$$

resembles the graph of the power function

Power Functions

$$f(x) = x^2$$

$$f(x) = x^4$$

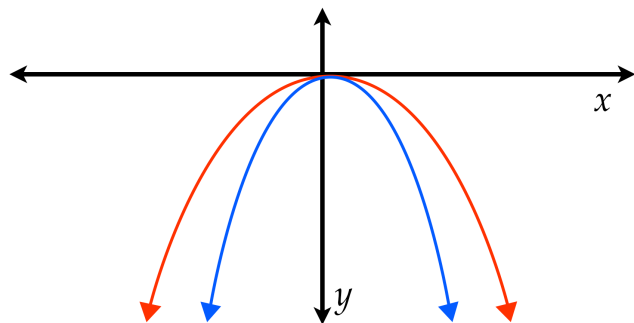


If the degree of $f(x)$ is even, and the leading coefficient is positive...

Power Functions

$$f(x) = -x^2$$

$$f(x) = -x^4$$

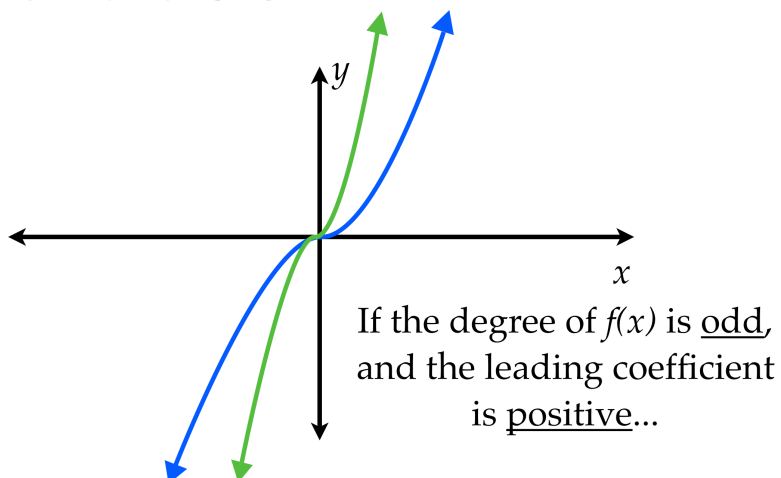


If the degree of $f(x)$ is even, and the leading coefficient is negative...

Power Functions

$$f(x) = x^3$$

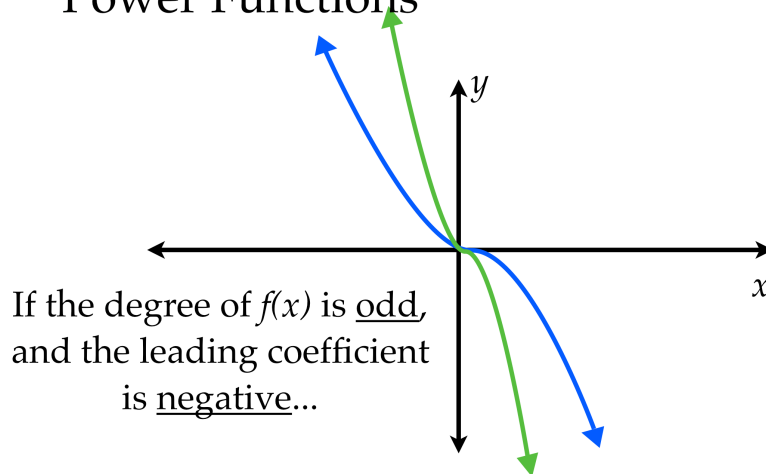
$$f(x) = x^5$$



Power Functions

$$f(x) = -x^3$$

$$f(x) = -x^5$$



End Behavior of a Polynomial

Determine the end behavior of the following polynomials

$$f(x) = 2x^5 + 8x^2 + 7x \approx 2x^5$$

$$f(x) = -x^8 + 6x^5 - 4x^2 + 2 \approx -x^8$$

Positive

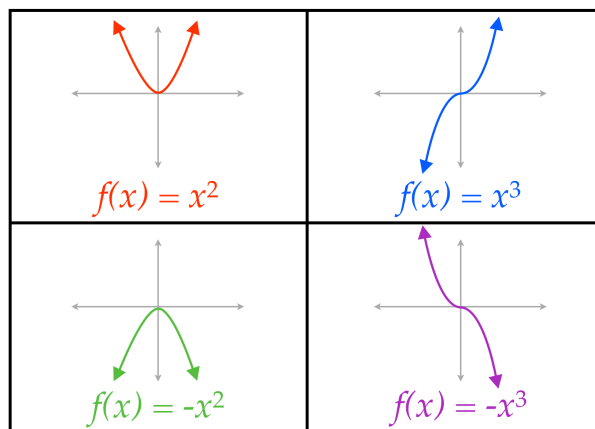
Leading
Coefficient

Negative

Degree

Even

Odd



End Behavior of a Polynomial

Determine the end behavior of the following polynomials

$$f(x) = -3x^7 + 8x^3 + 7x - 2 \approx -3x^7$$

$$f(x) = 2x^6 + 4x^3 + x^2 + 1 \approx 2x^6$$

Positive

Leading
Coefficient

Negative

Degree

Even

Odd

