

Names of Functions

0.1 Power Functions

Given $x, k, b \in \mathbb{R}$. A function of the form

$$f(x) = kx^m \tag{1}$$

is then a **power function** with **coefficient** k and **exponent** m .

0.2 Polynomial Functions

A **polynomial function** is one of the following:

- a power function with an integer exponent greater than or equal to 0.
- the sum of several power functions with integer exponents greater than or equal to 0.

Polynomial functions are categorized by the highest exponent in the function expression. For the constants a, b, c , and d , and a variable x , we have

function expression	function name
$ax + b$	1st-degree function/polynomial (linear)
$ax^2 + bx + c$	2nd-degree function/polynomial (quadratic)
$ax^3 + bx^2 + cx + d$	3rd-degree function/polynomial (cubic)

Example 1

$4x^7 - 5x^2 + 4$ is a 7th-degree polynomial.

$\frac{2}{7}x^5 - 3$ is a 5th-degree polynomial.

0.3 Exponential Functions

Given $x, a, b, c, d \in \mathbb{R}$, where $b > 0$. A function f given as

$$f(x) = a \cdot b^{cx+d}$$

is then an **exponential function**.