Plotting polynomial function in Python

Aadhil imam

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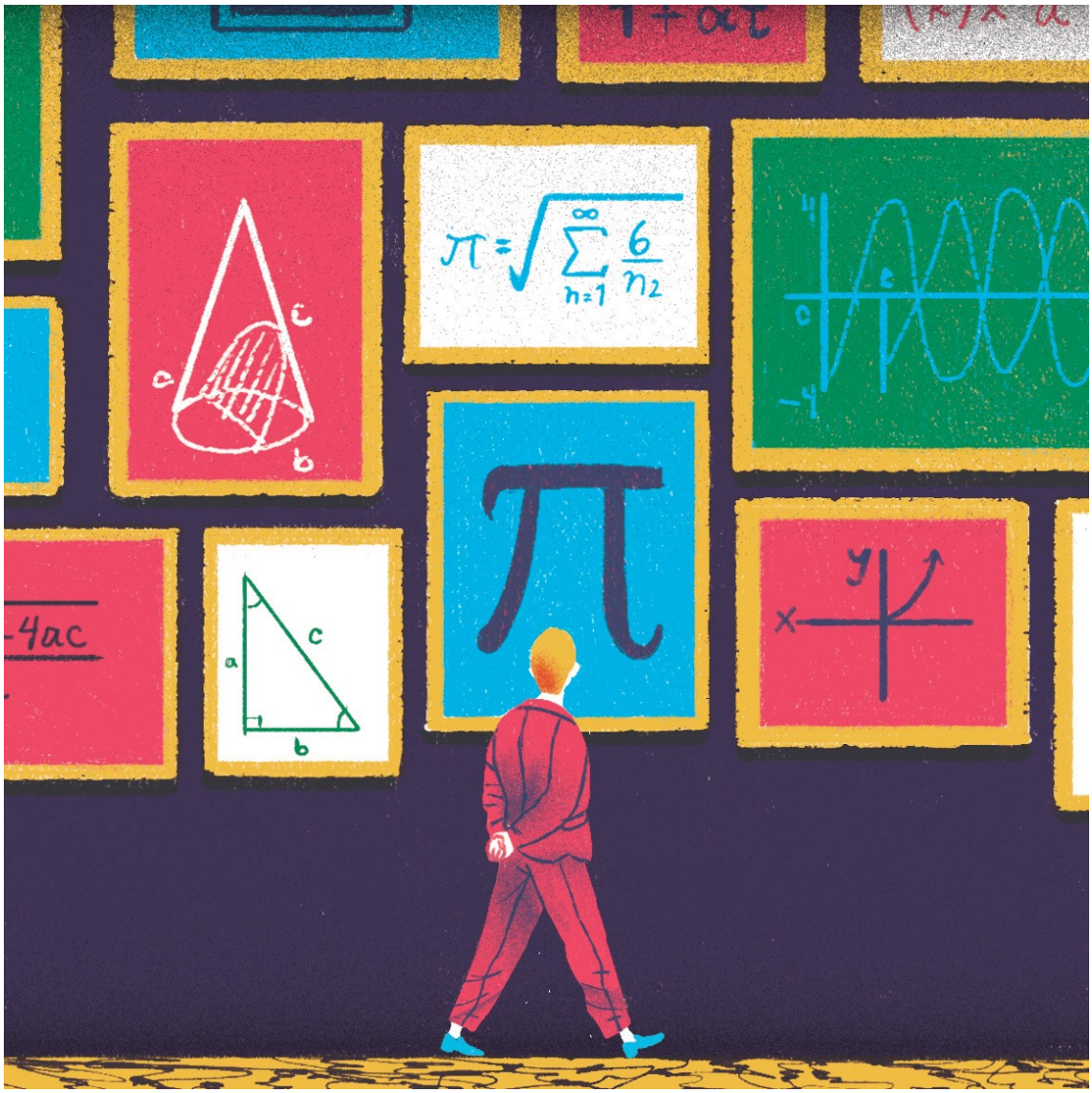


what is a polynomial functions ?

Polynomial functions are among the simplest, most important, and most commonly used mathematical functions. These functions consist of one or more terms of variables with whole number exponents

$$F(x) = a_n x^n + a^n{}_{-1} x^{n-1} + \ldots + a_2 x^2 + a_1 x + a_0$$

A polynomial function is a function such as a quadratic, a cubic, a quartic, and so on, involving only non-negative integer powers of x. We can give a general definition of a polynomial, and define its degree

for an example

$f(x) = 4x^3 — 3x^2 + 2$

this function called as cubic polynomial because polynomial of degree 3, as 3 is the highest power of x formula

$f(x) = 4x^2 - 2x - 4$

This is called as a quadratic, which is a polynomial of degree 2, as 2 is the highest power of x.

Let us plot a simple function using python

example: $f(x) = x^2 — 2x + 5$

pre-requisite

- *numpy*

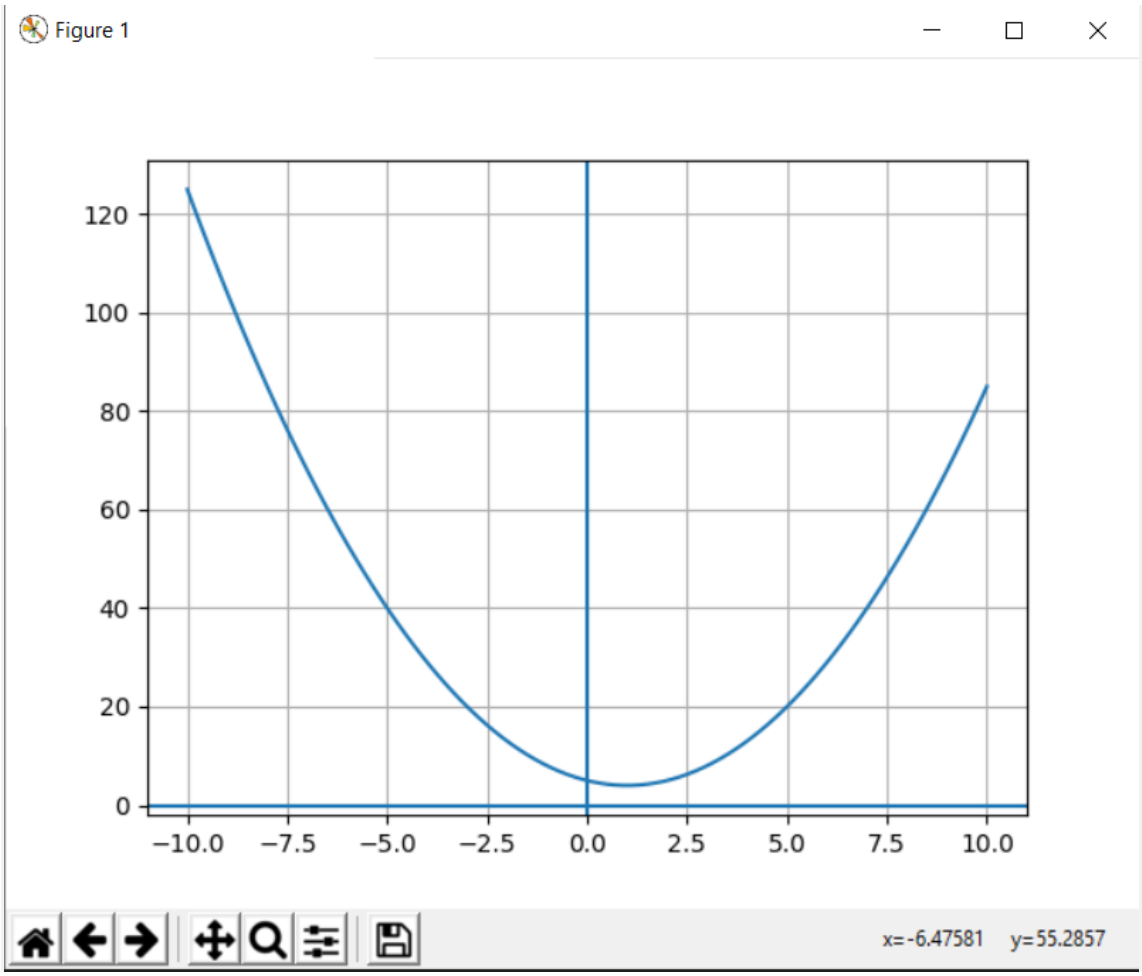
- *matplotlib*

ploy.py

```python
import numpy as np
import matplotlib.pyplot as plt

x = np.linspace(-10,10,num=100)

fx = []
for i in range(len(x)):
    fx.append(x[i]**2 - 2*x[i]+ 5)


plt.plot(x,fx)
plt.grid()
plt.axvline()
plt.axhline()
plt.show()
```

code

this is how the graph shows for this function



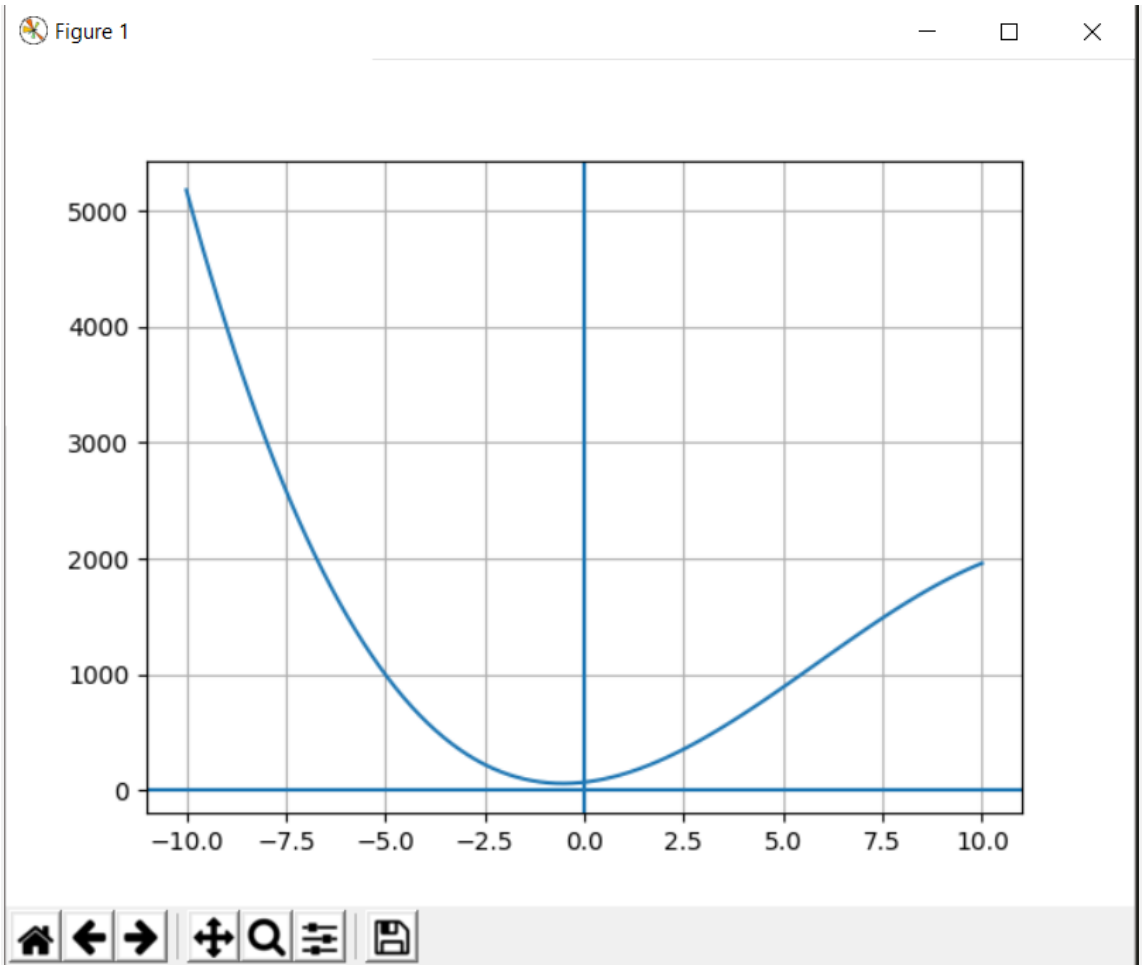
Let us see another complex polynomial function

exmple: $f(x) = x^3 — 3x^3 — 35x^2 + 39x + 70$

ploy.py

```python
import numpy as np
import matplotlib.pyplot as plt

x = np.linspace(-10,10,num=100)

fx = []
for i in range(len(x)):
    fx.append(x[i]**3 - 3*x[i]**3+ 35*x[i]**2+39*x[i]+70)


plt.plot(x,fx)
plt.grid()
plt.axvline()
plt.axhline()
plt.show()
```

this how the graph shows for this function



This is how basic plotting polynomial using python let's see another article for advance polynomial functions

source
: http://www.mathcentre.ac.uk/resources/uploaded/mc-ty-polynomial-2009-1.pdf

Aadhil imam

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