

Use_PY_in_Calculus

June 28, 2018

1 Use PY in Calculus

1.1 What is Function

functions $x \mapsto f(x)$
domain range

1.1.1 polynomials

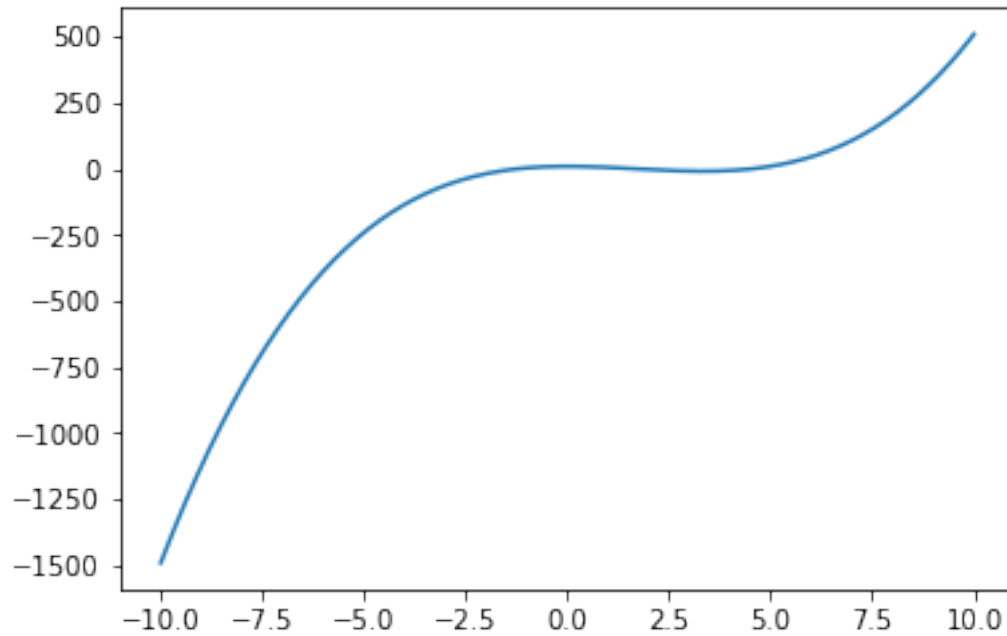
$$f(x) = x^3 - 5x^2 + 9 \quad x \rightarrow \infty \quad f(x) \rightarrow -\infty \quad x \rightarrow \infty \quad f(x) \rightarrow \infty \quad R$$

```
In [1]: def f(x):  
        return x**3 - 5*x**2 + 9  
  
        print(f(1), f(2))
```

5 -3

```
In [3]: import numpy as np  
        import matplotlib.pyplot as plt  
        x = np.linspace(-10,10,num = 1000)  
        y = f(x)  
        plt.plot(x,y)
```

```
Out[3]: [<matplotlib.lines.Line2D at 0x6f6a6270>]
```



1.1.2 Exponential Functions

$\exp(x) = e^x$ domain is $-\infty, \infty$, range is $(0, \infty)$ py `e`

```
In [4]: def exp(x):
        return np.e**x

        print("exp(2) = e^2 = ",exp(2))
```

exp(2) = e^2 = 7.3890560989306495

numpy np.e**x

```
In [5]: def eexp(x):
        return np.e**(x)

        print("exp(2) = e^2 = ",eexp(2))
```

exp(2) = e^2 = 7.3890560989306495

```
In [57]: plt.plot(x,exp(x))
```

Out[57]: [matplotlib.lines.Line2D at 0x1137944a8]