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

# Define the variable and function
x = sp.symbols('x')
function = (x + 3) ** 2 # Define the function y = (x + 3)^2

# Compute the derivative (gradient) of the function
derivative = sp.diff(function, x)

# Convert the derivative to a Python function
gf = sp.lambdify(x, derivative, 'numpy')

# Initialize parameters
x_current = 2  # Start
lr = 0.01  # Learning Rate
precision = 0.000001
previous_step_size = 1
max_iter = 10000
iters = 0

# List to store the values of x for plotting
gd = []

# Gradient Descent Loop
while precision < previous_step_size and iters < max_iter:
    prev = x_current
    x_current = x_current - lr * gf(prev)
    previous_step_size = abs(x_current - prev)
    iters += 1
    print('Iteration: ', iters, 'Value: ',x_current)
    gd.append(x_current)
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Iteration:  1 Value:  1.9
Iteration:  2 Value:  1.8019999999999998
Iteration:  3 Value:  1.70596
Iteration:  4 Value:  1.6118408
Iteration:  5 Value:  1.519603984
Iteration:  6 Value:  1.42921190432
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Iteration:  570 Value:  -2.999950130714142
Iteration:  571 Value:  -2.999951128099859
```
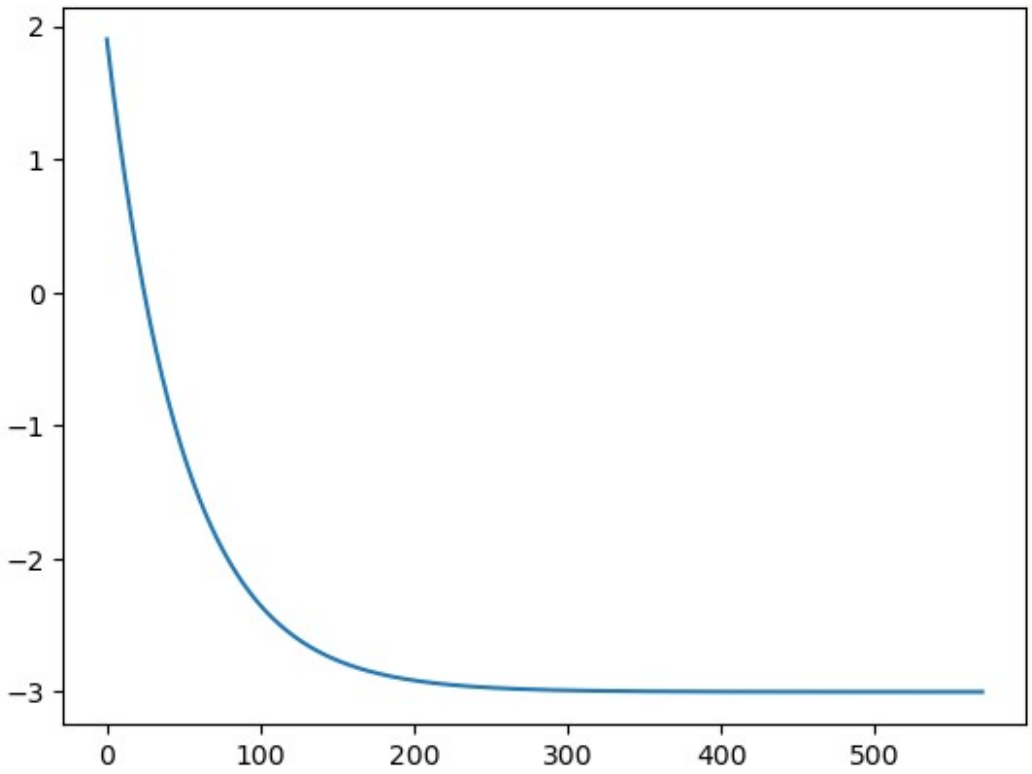

```
print('Local Minima : ', x_current)
```

```
Local Minima :  -2.999951128099859
```

```
# Plotting the convergence of x values
plt.plot(range(iters), gd)
```

```
[<matplotlib.lines.Line2D at 0x204c87891f0>]
```



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

# # Initialize parameters
# x = 2  # Starting point
# lr = 0.01  # Learning Rate
# precision = 0.000001
# previous_step_size = 1
# max_iter = 10000
# iters = 0

# # Gradient function: derivative of (x + 3)^2
# gf = lambda x: 2 * (x + 3)

# # List to store the values of x for plotting
# gd = []

# # Gradient Descent Loop
# while previous_step_size > precision and iters < max_iter:
#     prev = x
#     x = x - lr * gf(prev)  # Update x using the gradient
#     previous_step_size = abs(x - prev)  # Calculate the step size
#     iters += 1
#     print('Iteration: ', iters, 'Value: ', x)
#     gd.append(x)

# print('Local Minima: ', x)

# # Plotting the convergence of x values
# plt.plot(range(iters), gd)

# pip install sympy
```