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import matplotlib.pyplot as plt
import numpy as np

# Gradient Descent Algorithm to find the local minima of
# the function  $y = (x + 3)^2$ 

# Define the function and its derivative
def given_function(x):
    return (x + 3) ** 2

def derivative(x):
    return 2 * (x + 3)

def gradient_descent(function, start, learn_rate, n_iter = 100,
                      tolerance = 0.1):
    gradient = derivative
    function = given_function
    points = [start]
    iters = 0

    while iters < n_iter:
        prev_x = start
        start = start - learn_rate * gradient(prev_x)
        iters = iters+1
        points.append(start)
    print("The local minimum occurs at", start)

    x_ = np.linspace(-7, 5, 100)
    y = function(x_)

    fig = plt.figure(figsize = (10, 10))
    plt.plot(x_, y, 'g')
    plt.plot(points, function(np.array(points)), '-o')

    plt.show()

gradient_descent(function = given_function, start = 2.0, learn_rate =
0.2,
                  n_iter = 50)

```

The local minimum occurs at -2.99999999959586

