

In [7]:

```

x = 2
lr = 0.01
precision = 0.000001
previous_step_size = 1
max_iter = 10000
iters = 0
gf = lambda x: (x+3) ** 2

```

In [8]:

```
1 import matplotlib.pyplot as plt
```

In [9]:

```
1 gd = []
```

In [10]:

```

1 while precision < previous_step_size and iters < max_iter:
2     prev = x
3     x = x - lr * gf(prev)
4     previous_step_size = abs(x - prev)
5     iters += 1
6     print('Iteration:', iters, 'Value:', x)
7     gd.append(x)

```

```

Iteration: 1 Value: 1.75
Iteration: 2 Value: 1.524375
Iteration: 3 Value: 1.31967530859375
Iteration: 4 Value: 1.133079360877005
Iteration: 5 Value: 0.9622559108439301
Iteration: 6 Value: 0.8052611918137536
Iteration: 7 Value: 0.6604610644345152
Iteration: 8 Value: 0.5264713123921045
Iteration: 9 Value: 0.4021113132208596
Iteration: 10 Value: 0.28636769934540596
Iteration: 11 Value: 0.1783655727923978
Iteration: 12 Value: 0.07734549564927831
Iteration: 13 Value: -0.017355057346650715
Iteration: 14 Value: -0.10631676588600673
Iteration: 15 Value: -0.19005079247993095
Iteration: 16 Value: -0.26900893796835756
Iteration: 17 Value: -0.34359205977732477
Iteration: 18 Value: -0.41415709122610556
Iteration: 19 Value: -0.4810229267146679
Iteration: 20 Value: -0.5444752816732322

```

In [12]:

```
1 print('Local Minima:', x)
```

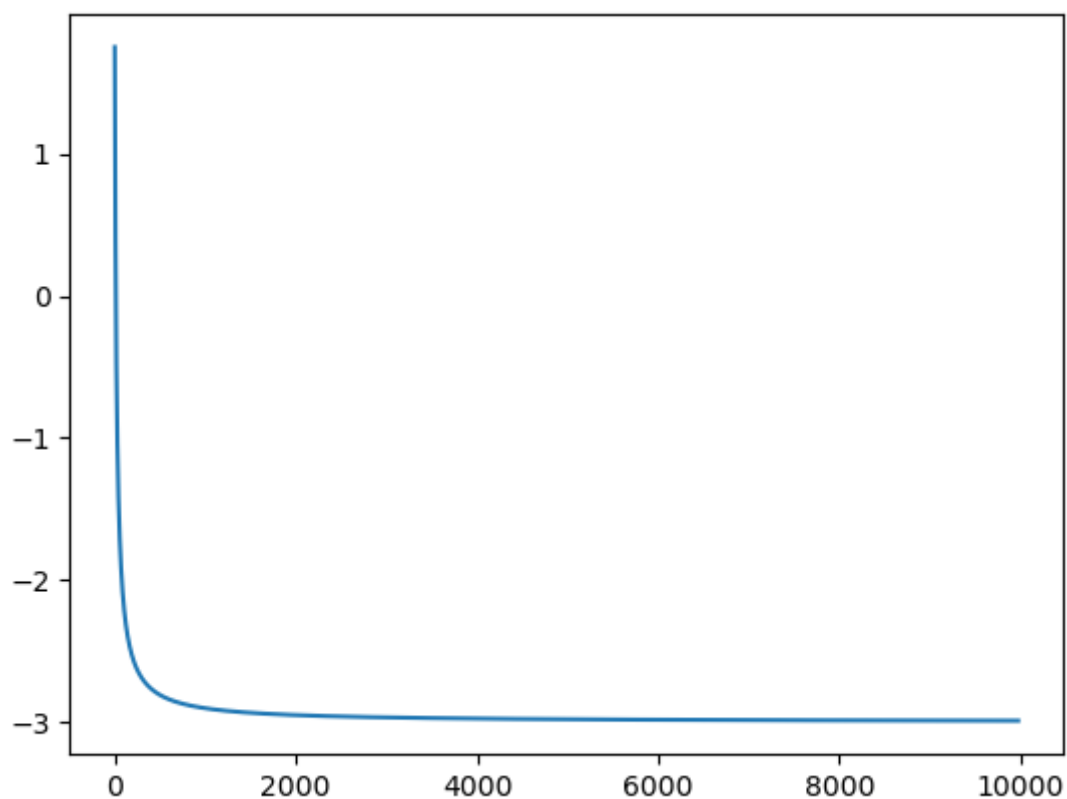
Local Minima: -2.990001240409911

In [15]:

```
1 plt.plot(gd)
```

Out[15]:

```
[<matplotlib.lines.Line2D at 0x206d090a1f0>]
```



In []:

```
1
```