Homework 3 Dholakia

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1 Problem 1

1.1 Response:

As δ gets closer to 0, (in other words, as the negative powers of 10 increase), the accuracy of the derivative increases steadily, but then decreases. The initial increase in accuracy is simply because the value of δ is closer to zero. However, the following decrease in accuracy is due to an approximation error caused by the order of magnitude difference between the numerator and δ.

2 Problem 2

2.1 Response:

For problem 2 I created 3 pairs of arrays of different dimensions and multiplied them using two different methods. While clunky, the code demonstrates the differences between the explicit method's results and the np.dot() method built into the numpy module.

3 Problem 3

3.1 Response:

As the number of steps increases, so does the standard deviation σ.