Forward Difference:

[[1.0000000e+00 3.2552478e+02 2.4241745e+01]

[2.0000000e+00 3.0360397e+02 2.3209255e+00]

[3.0000000e+00 3.0151416e+02 2.3109803e-01]

[4.0000000e+00 3.0130615e+02 2.3103321e-02]

[5.0000000e+00 3.0128537e+02 2.3136961e-03]

[6.0000000e+00 3.0128329e+02 2.3486967e-04]

[7.0000000e+00 3.0128308e+02 2.6282743e-05]

[8.0000000e+00 3.0128305e+02 1.8400733e-06]

[9.0000000e+00 3.0128305e+02 1.8400733e-06]

[1.0000000e+01 3.0128320e+02 1.4394862e-04]

[1.1000000e+01 3.0128433e+02 1.2808170e-03]

[1.3000000e+01 3.0070169e+02 5.8136421e-01]

[1.4000000e+01 3.0979663e+02 8.5135832e+00]

[1.5000000e+01 2.5579538e+02 4.5487663e+01]

[1.6000000e+01 0.0000000e+00 3.0128305e+02]

[1.7000000e+01 0.0000000e+00 3.0128305e+02]

[1.8000000e+01 0.0000000e+00 3.0128305e+02]

[1.9000000e+01 0.0000000e+00 3.0128305e+02]

[2.0000000e+01 0.0000000e+00 3.0128305e+02]]

Simpson Composite Rule:

n: 10 | Approximation: 7.236975667906812 | Error: 0.002021901298907558

n: 20 | Approximation: 7.235076638626692 | Error: 0.00012287201878802279

n: 50 | Approximation: 7.234956887418746 | Error: 3.120810841750199e-06

n: 100 | Approximation: 7.234953961438759 | Error: 1.9483085456073468e-07

n: 1000 | Approximation: 7.234953766627376 | Error: 1.9471535495085845e-11

n: 100000 | Approximation: 7.23495376660792 | Error: 1.5987211554602254e-14

n: 1000000 | Approximation: 7.234953766607891 | Error: 1.3322676295501878e-14