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Computational
Exercise 12

Here, when we generalize the mean value theorem to 10 dimensions, then we can estimate the analytical value to be 25.83333 which is 155/6. The following is the results of my code:

This is the results for four different runs: 38.060744425973866 33.16412488142726 16.62382834425392 16.148986181094028
This is the average value for 50 runs and 100 iterations: 24.73167433710466
This is the average value for 10000 runs: 24.86302649291986

This shows that my function will be relatively close to the value, but not very precise. My results range from 17 to 40. When running the code 50 times to iterate 100 times for the mean value integral, the average is pretty close to what we expect. 23.855 to 25.833. Although, the value actually ranges pretty big still. When changing the iterations, if the value of iterations were too small, the result was too large, if the value of N was too big, the result was too small. For me, about 100 was good. This method of determining the integral seems faster in computing. The code does take a second, but it is far better than I expected.