4. (40 points) Find the solution to

$$\begin{aligned} &\min f = x_1^2 + x_2^2 + x_3^2 \\ &\text{subject to } h_1 = x_1^2/4 + x_2^2/5 + x_3^2/25 - 1 = 0 \\ &\text{and } h_2 = x_1 + x_2 - x_3 = 0, \end{aligned}$$

by implementing the generalized reduced gradient algorithm.

Please see P4.py for implementation.

SOLUTION:

x_1 = -1.5734565212082046

x_2 = 1.3775400393827768

x_3 = -0.19628458303223428

Value of f: 4.411909621771465