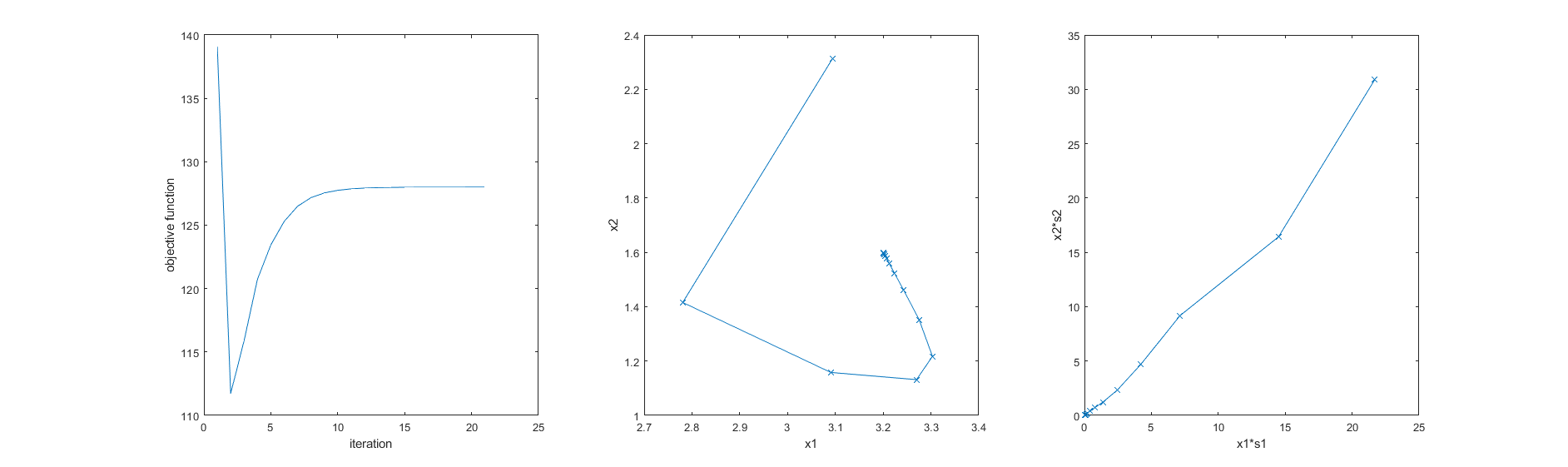
1) The code can be found attached with the report.

2,3,4)

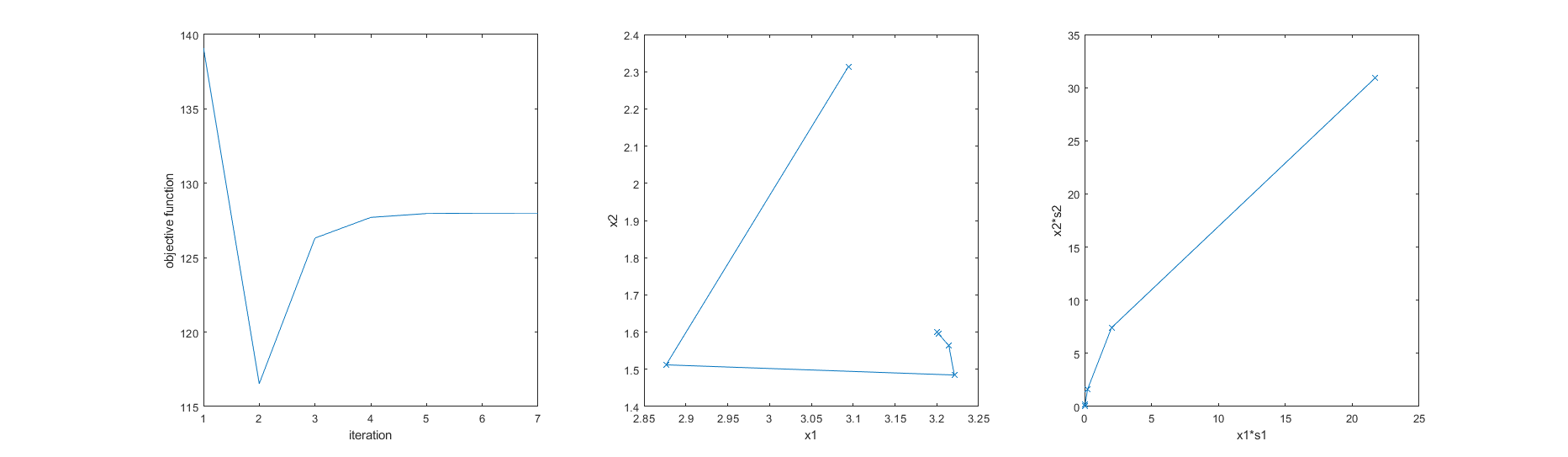
**First problem:**

s.t

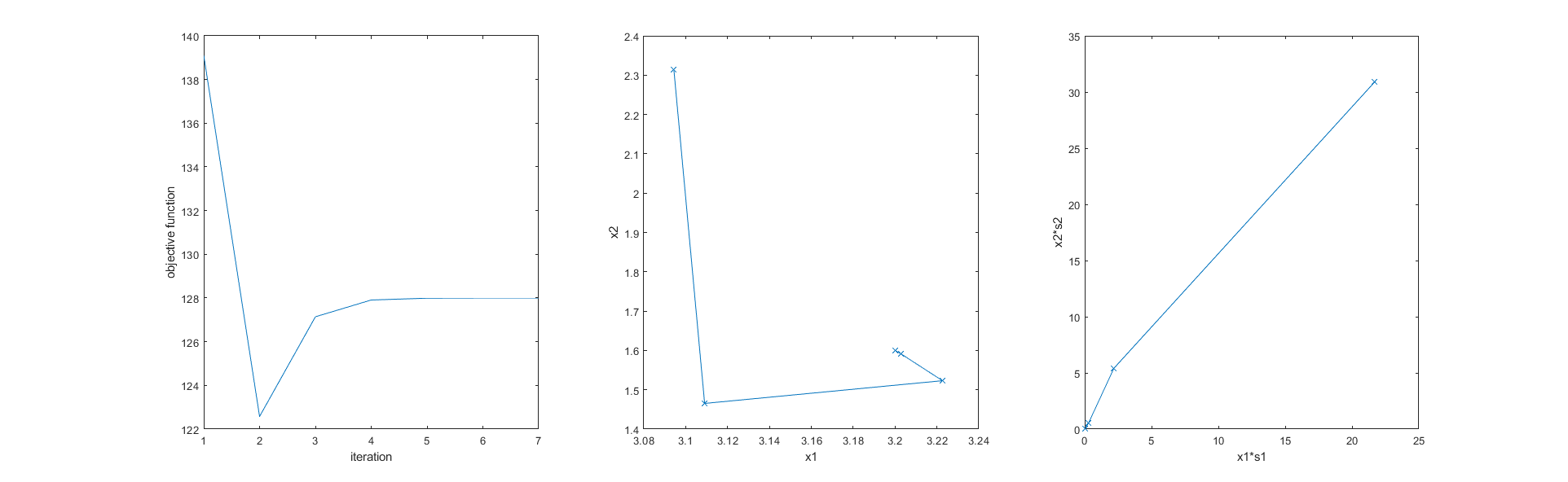
**Fixed central**



**Adaptive central**



**Mehrotra**



The fixed central path converges after 20 iterations to give the same results as Mehrotra and adaptive central path.

The built-in function gives the same results as Mehrotra and converges also in 7 iterations. On the other hand, my implementation of Mehrotra and adaptive central path converges in 6 iterations

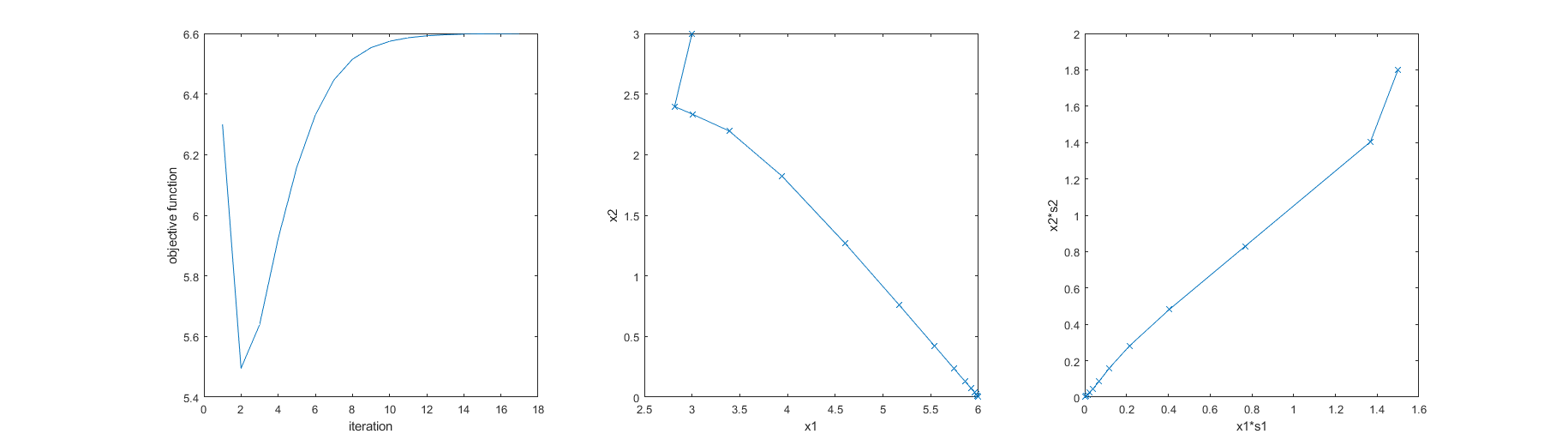
Optimum point

With value = 128

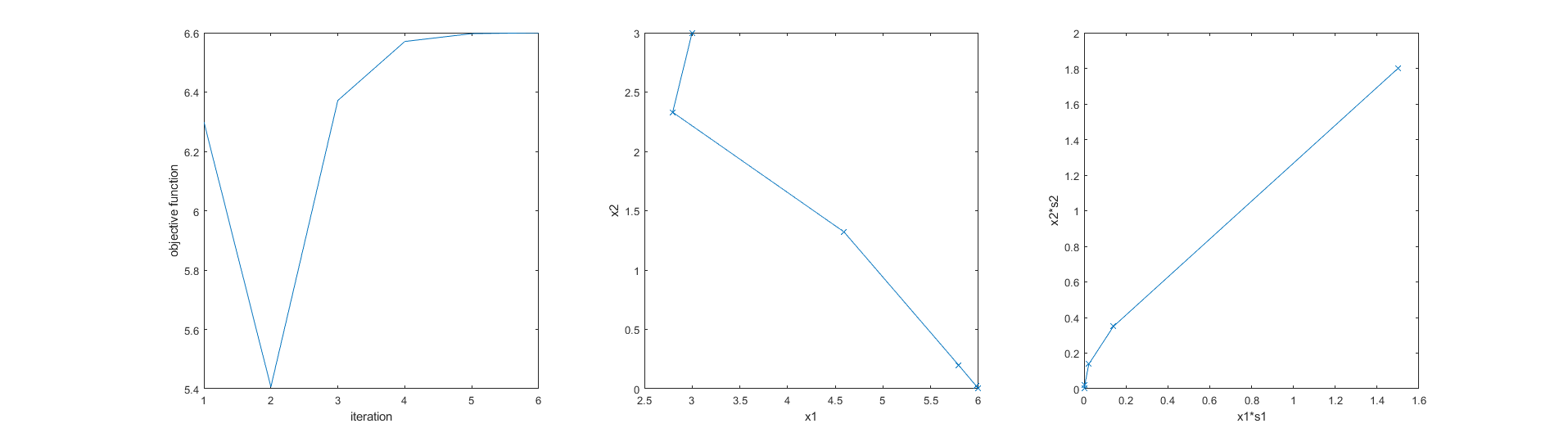
**Second problem:**

s.t

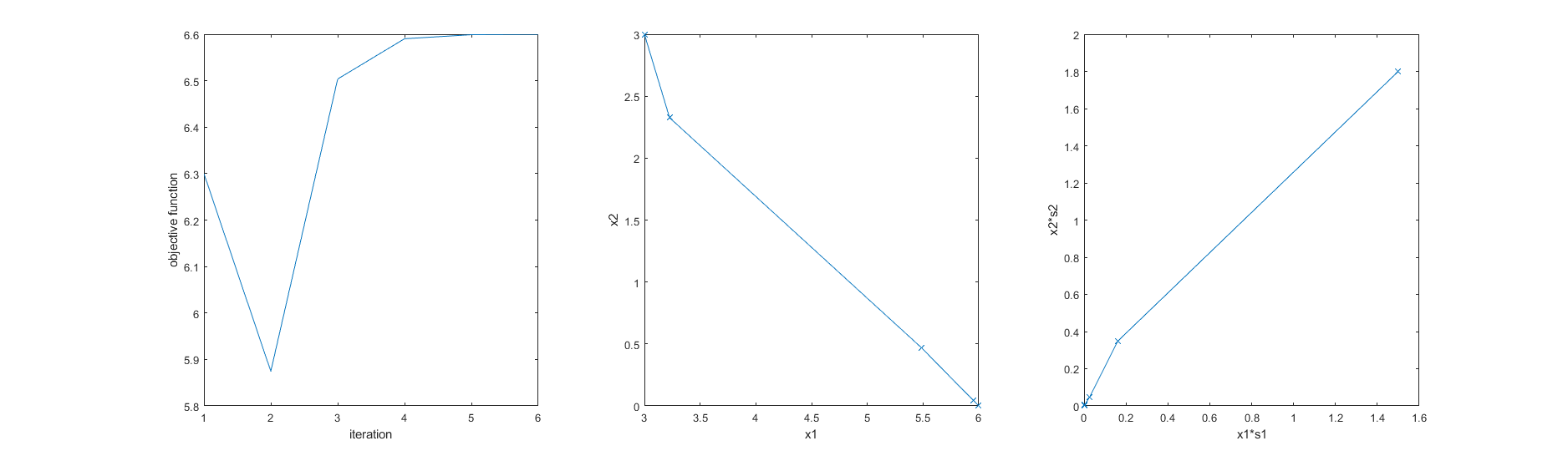
**Fixed central**



**Adaptive central**



**Mehrotra**



The fixed central path converges after 16 iterations to give the same results as Mehrotra and adaptive central path.

The built-in function gives the same results as Mehrotra and converges in 5 iterations the same as my implementation.

Optimum point

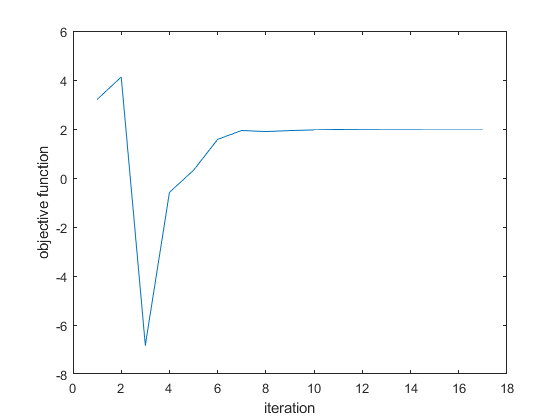
With value = 6.6

**Third problem:**

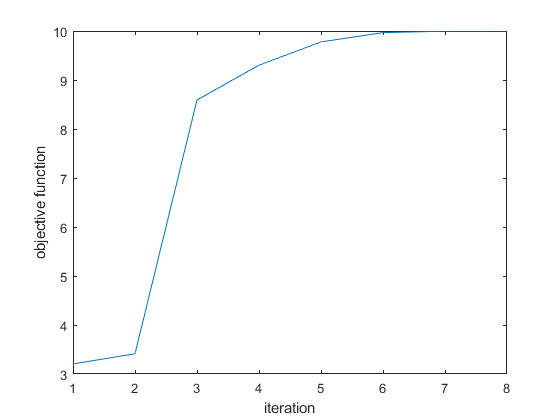
s.t

Since this is a three-dimensional problem the complementary and point progress are hard to visualize so I only include the objective function

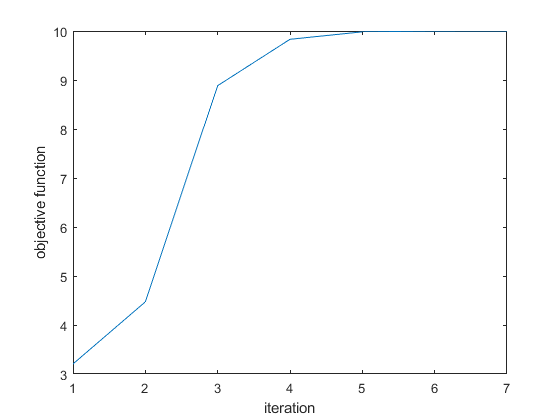
**Fixed central**



**Adaptive central**



**Mehrotra**



The fixed central path doesn’t converge because the fixed step size makes the non-negativity condition unsatisfied which terminates the program without reaching a solution

The built-in function gives the same results as Mehrotra and converges in 5 iterations. On the other hand, my implementation of Mehrotra converges in 6 iterations while adaptive central path converges in 7 iterations

Optimum point

With value = 10