HW7

Solve the problem

$$4x_1 - x_2 - x_4 = 0$$
$$-x_1 + 4x_2 - x_3 - x_5 = -1$$
$$-x_2 + 4x_3 + x_5 - x_6 = 9$$
$$-x_1 + 4x_4 - x_5 - x_6 = 4$$
$$-x_2 - x_4 + 4x_5 - x_6 = 8$$
$$-x_3 - x_5 + 4x_6 = 6$$

by (a) Jacobi method, (b) Gauss-Seidel method, (c) SOR method, and (d) the conjugate gradient method.

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PS D:\python_class> & D:/anaconda/python.exe d:/python_class/numerical/HW7.py
(a) Jacobi Method:
Solution after 47 iterations:
[1.17478856 1.64317358 2.44824809 3.05598067 3.94965767 3.09947644]

(b) Gauss-Seidel Method:
Solution after 18 iterations:
[1.17478856 1.64317358 2.44824809 3.05598067 3.94965767 3.09947644]

(c) SOR Method (ω=1.5):
Solution after 51 iterations:
[1.17478856 1.64317358 2.44824809 3.05598067 3.94965767 3.09947644]

(d) Conjugate Gradient Method:
Solution after 100 iterations:
[1.17505699 1.64331112 2.44841523 3.05536935 3.94896489 3.09877197]
```