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.

```
(a) Jacobi Method:
Jacobi method converged in 30 iterations.
Solution (Jacobi): [1.17478828 1.64317349 2.44824791 3.05598043 3.94965729 3.09947641]

(b) Gauss-Seidel Method:
Gauss-Seidel method converged in 13 iterations.
Solution (Gauss-Seidel): [1.17478836 1.64317351 2.44824812 3.05598056 3.94965762 3.09947644]

(c) SOR Method:
SOR method converged in 14 iterations with omega = 1.2.
Solution (SOR with omega=1.2): [1.17478829 1.64317339 2.44824815 3.05598048 3.9496576  3.09947646]

(d) Conjugate Gradient Method:
Conjugate Gradient method did not converge within 100 iterations.
Solution (Conjugate Gradient): [1.17505699 1.64331112 2.44841523 3.05536935 3.94896489 3.09877197]
```