习题五.

1、雅可比：$\begin{cases} x_1^{k+1} = (2 - x_2^k)/3 \\ x_2^{k+1} = (1 - x_1^k)/2 \end{cases}$ $x^0 = (0,0)^T$, $x^1 = (\frac{2}{3}, \frac{1}{2})^T$, $x^2 = (\frac{1}{2}, \frac{1}{6})^T$

G-S：$\begin{cases} x_1^{k+1} = (2 - x_2^k)/3 \\ x_2^{k+1} = (1 - x_1^{k+1})/2 \end{cases}$ $x^0 = (0,0)^T$, $x^1 = (\frac{2}{3}, \frac{1}{6})^T$, $x^2 = (\frac{11}{18}, \frac{7}{36})$

5.(1) Jacobi：$\begin{cases} x_1^{k+1} = -1 - 2x_2^k \\ x_2^{k+1} = 2 - 3x_1^k \end{cases}$ $x^0 = (0,0)^T$, $x^1 = (-1,2)^T$, $x^2 = (-5,5)$

G-S：$\begin{cases} x_1^{k+1} = -1 - 2x_2^k \\ x_2^{k+1} = 2 - 3x_1^{k+1} \end{cases}$ $x^0 = (0,0)^T$, $x^1 = (-1,5)^T$, $x^2 = (-11,17)$

(2) Jacobi：$\begin{cases} x_1^{k+1} = 2 - 5x_2^k + 3x_3^k \\ x_2^{k+1} = (4 - 5x_1^k - x_3^k)/(-2) \\ x_3^{k+1} = (-11 - 2x_1^k - x_2^k)/(-5) \end{cases}$ $x^0 = (0,0,0)^T$, $x^1 = (2,-2,\frac{11}{5})^T$, $x^2 = (\frac{93}{5}, \frac{41}{10}, \frac{13}{5})^T$

G-S：$\begin{cases} x_1^{k+1} = 2 - 5x_2^k + 3x_3^k \\ x_2^{k+1} = (4 - 5x_1^{k+1} - x_3^k)/(-2) \\ x_3^{k+1} = (-11 - 2x_1^{k+1} - x_2^{k+1})/(-5) \end{cases}$ $x^0 = (0,0,0)^T$, $x^1 = (2,3,\frac{18}{5})^T$, $x^2 = (-\frac{11}{5}, -\frac{57}{10}, \frac{19}{50})^T$

7. $\begin{cases} x_1^{k+1} = x_1^k + 1.25(16 - 4x_1^k - 3x_2^k)/4 \\ x_2^{k+1} = x_2^k + 1.25(20 - 3x_1^{k+1} - 4x_2^k + x_3^k)/4 \\ x_3^{k+1} = x_3^k + 1.25(-12 + x_2^{k+1} - 4x_3^k)/4 \end{cases}$ $x^0 = (0,0,0)^T$, $x^1 = (5, \frac{25}{16}, -\frac{835}{256})^T$, $x^2 = (\frac{585}{256}, \frac{109}{40}, \frac{8535}{4096})^T$