$$A = \begin{pmatrix} 5 & -4 & -7 \\ -4 & 9 & 7 \\ -7 & 7 & 11 \end{pmatrix} \quad \bar{b} = \begin{pmatrix} -1 \\ 1 \\ -1 \end{pmatrix} \quad \bar{x}^0 = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix} \quad k = 3$$

$$\bar{r}^0 = \bar{b} - A \cdot \bar{x}^0 = \begin{pmatrix} -1 \\ 1 \\ -1 \end{pmatrix} - \begin{pmatrix} 5 & -4 & -7 \\ -4 & 9 & 7 \\ -7 & 7 & 11 \end{pmatrix} \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix} = \begin{pmatrix} -1 \\ 1 \\ -1 \end{pmatrix}$$

$$\omega_0 = 0{,}58463896$$

$$\bar{x}^1 = \bar{x}^0 + \omega_0 \cdot \bar{r}^0 = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix} + 0{,}58464 \cdot \begin{pmatrix} -1 \\ 1 \\ -1 \end{pmatrix} = \begin{pmatrix} -0{,}58464 \\ 0{,}58464 \\ -0{,}58464 \end{pmatrix}$$

$$\bar{r}^1 = \begin{pmatrix} -1 \\ 1 \\ -1 \end{pmatrix} - \begin{pmatrix} 5 & -4 & -7 \\ -4 & 9 & 7 \\ -7 & 7 & 11 \end{pmatrix} \begin{pmatrix} -0{,}58464 \\ 0{,}58464 \\ -0{,}58464 \end{pmatrix} = \begin{pmatrix} -1 \\ 1 \\ -1 \end{pmatrix} - \begin{pmatrix} -1{,}16928 \\ 3{,}50784 \\ 1{,}75392 \end{pmatrix} = \begin{pmatrix} 0{,}16928 \\ -2{,}50784 \\ -2{,}75392 \end{pmatrix}$$

$$\omega_1 = 0{,}09373877$$

$$\bar{x}^2 = \begin{pmatrix} -0{,}58464 \\ 0{,}58464 \\ -0{,}58464 \end{pmatrix} + 0{,}09374 \begin{pmatrix} 0{,}16928 \\ -2{,}50784 \\ -2{,}75392 \end{pmatrix} = \begin{pmatrix} -0{,}58464 \\ 0{,}58464 \\ -0{,}58464 \end{pmatrix} + \begin{pmatrix} 0{,}01587 \\ -0{,}23508 \\ -0{,}25815 \end{pmatrix} = \begin{pmatrix} -0{,}56877 \\ 0{,}34956 \\ -0{,}84279 \end{pmatrix}$$

$$\bar{r}^2 = \begin{pmatrix} -1 \\ 1 \\ -1 \end{pmatrix} - \begin{pmatrix} 5 & -4 & -7 \\ -4 & 9 & 7 \\ -7 & 7 & 11 \end{pmatrix} \begin{pmatrix} -0{,}56877 \\ 0{,}34956 \\ -0{,}84279 \end{pmatrix} = \begin{pmatrix} -1 \\ 1 \\ -1 \end{pmatrix} - \begin{pmatrix} 1{,}65744 \\ -0{,}47841 \\ -2{,}84238 \end{pmatrix} = \begin{pmatrix} -2{,}65744 \\ 1{,}47841 \\ +0{,}84238 \end{pmatrix}$$

$$\omega_2 = 0{,}05095429$$

$$\bar{x}^3 = \begin{pmatrix} -0{,}56877 \\ 0{,}34956 \\ -0{,}84279 \end{pmatrix} + 0{,}05095 \cdot \begin{pmatrix} -2{,}65744 \\ 1{,}47841 \\ +0{,}84238 \end{pmatrix} = \begin{pmatrix} -0{,}56877 \\ 0{,}34956 \\ -0{,}84279 \end{pmatrix} + \begin{pmatrix} -0{,}1354 \\ 0{,}07532 \\ 0{,}09387 \end{pmatrix} = \begin{pmatrix} -0{,}70417 \\ 0{,}42488 \\ -0{,}74892 \end{pmatrix}$$

Přesné řešení: $\bar{x} = \begin{pmatrix} -3,6 \\ 0,72 \\ -2,84 \end{pmatrix}$

Výpočet chyby:

$$\bar{e}^0 = \bar{x}^* - \bar{x}^0 = \begin{pmatrix} -3,6 \\ 0,72 \\ -2,84 \end{pmatrix} - \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix} = \begin{pmatrix} -3,6 \\ 0,72 \\ -2,84 \end{pmatrix}$$

$$\bar{e}^1 = \bar{x} - \bar{x}^1 = \begin{pmatrix} -3,6 \\ 0,72 \\ -2,84 \end{pmatrix} - \begin{pmatrix} -0,58464 \\ 0,58464 \\ -0,58464 \end{pmatrix} = \begin{pmatrix} -3,01536 \\ 0,13536 \\ -2,25536 \end{pmatrix}$$

$$\bar{e}^2 = \bar{x} - \bar{x}^2 = \begin{pmatrix} -3,6 \\ 0,72 \\ -2,84 \end{pmatrix} - \begin{pmatrix} -0,56877 \\ 0,34956 \\ -0,84279 \end{pmatrix} = \begin{pmatrix} -3,03123 \\ 0,37044 \\ -1,99721 \end{pmatrix}$$

$$\bar{e}^3 = \bar{x} - \bar{x}^3 = \begin{pmatrix} -3,6 \\ 0,72 \\ -2,84 \end{pmatrix} - \begin{pmatrix} -0,70417 \\ 0,42488 \\ -0,74892 \end{pmatrix} = \begin{pmatrix} -2,89583 \\ 0,29512 \\ -2,09108 \end{pmatrix}$$