Exercise 1. Textbook exercise 1.1.1

Exercise 2. Textbook exercise 1.1.7

Exercise 3. Write a system of equations that is equivalent to the vector equation

$$x_1 \begin{pmatrix} 6 \\ -1 \\ 5 \end{pmatrix} + x_2 \begin{pmatrix} -3 \\ 4 \\ 0 \end{pmatrix} = \begin{pmatrix} 1 \\ -7 \\ -5 \end{pmatrix}$$

Exercise 4. Write a vector equation that is equivalent to the system

$$\begin{array}{rrrrrrr}
x_1 & - & 3x_2 & + & 4x_3 & = & -4 \\
3x_1 & - & 7x_2 & + & 7x_3 & = & -8 \\
-4x_1 & + & 5x_2 & - & x_3 & = & 7
\end{array}$$

Exercise 5. Determine if $\mathbf{b}$ is a linear combination of $\mathbf{a}_1, \mathbf{a}_2$ and $\mathbf{a}_3$.

$$\mathbf{a}_1 = \begin{pmatrix} 1 \\ -2 \\ 0 \end{pmatrix}, \quad \mathbf{a}_2 = \begin{pmatrix} 0 \\ 1 \\ 2 \end{pmatrix}, \quad \mathbf{a}_3 = \begin{pmatrix} 5 \\ -6 \\ 8 \end{pmatrix}, \quad \mathbf{b} = \begin{pmatrix} 2 \\ -1 \\ 6 \end{pmatrix}$$