**Problem 1:** Do problem 2 from section 3.5 (pg. 168) in the book.

**Problem 2:** Do problem 17 from section 3.5 (pg. 169).

**Problem 3:** Do problem 11 from section 3.6 (pg. 181).

**Problem 4:** Define the following matrices:

\[ A = \begin{bmatrix} -1 & 1 \\ 2 & 4 \\ 3 & 0 \end{bmatrix} \]

\[ B = \begin{bmatrix} 1 & 3 & 1 & 0 \\ 2 & -1 & -1 & 7 \\ 1 & 0 & -2/7 & 2 \end{bmatrix} \]

First write down the dimensions of the four fundamental subspaces of \( A \) and \( B \) by calculating their ranks. Then find bases for the subspaces.

**Problem 5:** Do problem 3 parts a),c) from section 4.1 (pg. 191).

**Problem 6:** Do problem 21 from section 4.1 (pg. 193).

**Problem 7:** a) Project the vector \((2, 7, 3)\) onto the line going through the origin and \((1, 1, 1)\).

b) Project the vector \((2, 4, 5)\) onto the column space of the matrix

\[ \begin{bmatrix} 1 & 1 \\ 1 & 1 \\ 0 & 1 \end{bmatrix} \]

**Problem 8:** a) Do problem 13 in section 4.2 (pg. 204).
b) Do problem 27 in section 4.2 (pg. 205).

**Problem 9:** Do problem 8 in section 8.2 (pg. 421). (The graph is the square one at the bottom of page 420.)

**Problem 10:** Do problem 11 in section 8.2 (pg. 421). Use the $A$ you just calculated for problem 8 in section 8.2.