This assignment is in two parts. The answers to questions in Part I are generally in the book. It is advisable to make every effort to solve the problem before consulting the answer. Page numbers are to the Text, Introduction to Linear Algebra, 5th edition, by Johnson, Riess, and Arnold.

**Part I**

Section 1.5

1. (a) Text: p. 59, #57  
   (b) Text: p. 61, #69

Section 1.6

2. (a) Text: p. 69, #21  
   (b) Text: p. 70, #43

Section 1.7

3. (a) Text: p.78, #11  
   (b) Text: p.79, #25

4. (a) Text: p.79, #31  
   (b) Text: p.79, #39

**Part II**

Sections 1.5-1.6

5. Let $A$ and $B$ be as follows:

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

   (a) For what value of $c$ is $AB$ symmetric?  
   (b) With the value of $c$ in part (a), is it true that $AB = BA$?

6. (a) Text: p. 69, #34  
   (b) Text: p.69, #40

Section 1.9. Page numbers refer to the supplementary exercises.

7. (a) Text: p.107, #9 (b), only.  
   (b) Text: p. 107, #10. *Hint:* For both parts, use eqn. (8) on p.98.

(over)
8. (MAPLE) (a) Text: p.106, #3. Notes: There are several ways to type the entries of a matrix in Maple. The simplest is probably

\[ A := \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix} \]

There are other ways and you can find out this information by typing \texttt{> ?matrix}.

To solve the problem use the command \texttt{> rref(Ag)}, where \( Ag \) is the \((4 \times 6)\) augmented matrix containing the column vectors.

(b) Determine which of the following matrices is non-singular and compute its inverse;

\[ B = \begin{bmatrix} 2 & 3 & 1 & 2 \\ -2 & 4 & -1 & 5 \\ 3 & 7 & 3 & 1 \\ 6 & 9 & 3 & 7 \end{bmatrix} \quad \quad \quad C = \begin{bmatrix} 4 & 0 & 0 & 0 \\ 6 & 7 & 0 & 0 \\ 9 & 11 & 1 & 0 \\ 5 & 4 & 1 & 1 \end{bmatrix} \]

The command to obtain the inverse of \( A \) is simply \texttt{> inverse(A)}; Maple will tell you if the matrix has no inverse; that is, if it is singular.

Check your answer by Maple. That is, perform the operation \( AA^{-1} = I \). Recall that Maple uses the command \&* to denote matrix multiplication. For example, you would enter \texttt{evalm(3*B&*A-4*A^3)} to evaluate the matrix \( 3BA - 4A^3 \).