Week 8

Section 4.4

1. Find the transpose of the following matrices:

   (a) $A = \begin{bmatrix} 10 & -3 \\ 6 & -7 \\ 2 & 5 \end{bmatrix}$

   (b) $B = \begin{bmatrix} 10 & -3 & 6 & -5 \\ 6 & -1 & 7 & -8 \end{bmatrix}$

   (c) $C = \begin{bmatrix} 10 & -3 & -1 & -3 \\ 6 & -7 & 25 & 32 \\ 2 & 25 & -2 & 6 \\ 5 & -5 & 5 & -5 \end{bmatrix}$

   (d) $D = \begin{bmatrix} 9 & 3 & -2 \\ 8 & 4 & 5 \\ 2 & 2 & -2 \\ 5 & -5 & 5 \end{bmatrix}$

2. Evaluate the following:

   (a) $(AB)^T$

   (b) $B^T A^T$

   (c) $D^T C$

   (d) $(D^T C)^T$

   (e) BC

   (f) $C^T B^T$

   (g) $(DA)^T$

Section 4.5

3. Calculate the inverses (if they exist) using the RREF method

(a) $X = \begin{bmatrix} 9 & 3 & -2 \\ 2 & 2 & -2 \\ 5 & -5 & 5 \end{bmatrix}$

(b) $Y = \begin{bmatrix} -1 & 0 & -5 \\ 6 & -3 & -5 \\ 1 & 2 & -1 \end{bmatrix}$

(c) $Z = \begin{bmatrix} 3 & 7 & -9 \\ 6 & 1 & 4 \\ -9 & 5 & 2 \end{bmatrix}$

(d) $U = \begin{bmatrix} 5 & -1 & -3 \\ -2 & 2 & 3 \\ 4 & 8 & 3 \end{bmatrix}$

(e) $V = \begin{bmatrix} 0 & 3 & -2 & 6 \\ 2 & 1 & -4 & 3 \\ 7 & -5 & 1 & 2 \\ 0 & 2 & -1 & 0 \end{bmatrix}$

(f) $W = \begin{bmatrix} 0 & 5 & -2 & -4 \\ 2 & 4 & -2 & 8 \\ -3 & 4 & -1 & 1 \\ 5 & 5 & -8 & 9 \end{bmatrix}$

4. Evaluate the following:

   (a) $(UX)^{-1}$

   (b) $(UX^T)^{-1}$

   (c) $(X^TY)^{-1}$

   (d) $Y^{-1}X^T$

Section 4.6

5. Calculate the determinant of the matrices from Question 3.