1.1

Vector Operations

$$\mathbf{u} = \begin{bmatrix} -1 & 0 & 1 \end{bmatrix} \quad \text{and} \quad \mathbf{v} = \begin{bmatrix} 2 \\ 4 \\ 6 \end{bmatrix}$$

    a. Find $\mathbf{u}^t$ = transpose(u). (Include the correct orientation as row or column.) **(2 pts.)**
    b. Find $\mathbf{v}^t$ = transpose(v). (Include the correct orientation as row or column.) **(2 pts.)**
    c. Find u v (inner product). **(2 pts.)**
    d. Find v x u (outer product). **(2 pts.)**

1.2

Matrix Operations

$$A = \begin{bmatrix} 1 & 0 & -1 \\ 2 & 1 & 0 \\ 0 & 1 & 2 \end{bmatrix} \quad B = \begin{bmatrix} 1 & 0 \\ 1 & 1 \\ 1 & 0 \end{bmatrix} \quad C = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 1 & -1 \\ 0 & -1 & 1 \end{bmatrix}$$

    a. Find B^t = transpose(B). **(2 pts.)**
    b. Find A B. **(2 pts.)**
    c. Find A – C. **(2 pts.)**
    d. Find C A. **(2 pts.)**

1.3

Quadratic Form

$$A = \begin{bmatrix} 2 & 0 & 1 \\ 0 & 1 & 1 \\ 1 & 1 & 0 \end{bmatrix} \quad b = \begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}$$

    a. Find b^t A b. **(5 pts.)**

1.4

Solution of a set of linear equations

$x + y - z = 0$
$x - y + z = 2$
$2x - 3y + z = -1$

    a. Solve for x, y and z **(9 pts.)**