Math 251 X01
Test One

Time: 50 minutes
Total: 25 marks

Name: _____

1. [5 marks] Let $\mathbf{u} = [2, -2, 5]$ and $\mathbf{v} = [-1, 3, 3]$. Calculate:

a) the length of the vector $\mathbf{u} + 7\mathbf{v}$

b) the projection of $\mathbf{v}$ onto $\mathbf{u}$

2. [5 marks] Find the general form of the plane through points $A = (3, 1, -2)$, $B = (6, 2, 1)$ and $C = (-1, 2, 6)$.

3. [5 marks] Find the angle between $\mathbf{u} = [1, 2, 3, 4]$ and $\mathbf{v} = [5, 4, 3, 2]$.

4. [5 marks] Find the distance between the point $P = (7, -2, 4)$ and the plane $2x - 6y + 3z = 12$.

5. [5 marks] Solve using Gauss-Jordan Elimination:

$$\begin{aligned} x + y + z &= 4 \\ 2x - y - 4z &= 5 \\ 7x + y - 5z &= 22 \end{aligned}$$