Math 220, Quiz 7 Section 11

Name:_____

ID Number:_____

Instructions: Clearly answer each of the questions below. Remember to check the back side. Show your work and any formulas you employ. Simplify all answers as far as possible.

1. (1 pt) If $\mathbf{u}$ and $\mathbf{v}$ are orthogonal vectors, then what equation to they solve? $\mathbf{u} \cdot \mathbf{v} = 0$

2. (1 pt) Calculated $||[2, 5, 1, -3]||$. $\sqrt{39}$

3. Let $A = \begin{bmatrix} 4 & 0 & -1 \\ 1 & -1 & 2 \\ 1 & 1 & 2 \end{bmatrix}$.

   (a) (3 pts) Calculate $A^T A$. $\begin{bmatrix} 18 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 9 \end{bmatrix}$

   (b) (3 pts) Calculate A^{-1} (*Hint: if* $A^T A = D$, *the* $D^{-1} A^T = A^{-1}$). $\begin{bmatrix} 2/9 & 1/18 & 1/18 \\ 0 & -1/2 & 1/2 \\ -1/9 & 2/9 & 2/9 \end{bmatrix}$