MATH 2270-003 Exam 2 Fall 2010

NAME : _____

You may not use a calculator. Your solutions must include enough justification that another person could understand and be convinced by your argument.
There are extra blank pages at the end of the booklet. If you need more room to work a problem please note the page number where your work continues.

QUESTION	VALUE	SCORE
1	10	
2	15	
3	15	
4	15	
5	5	
6	5	
7	15	
8	5	
9	10	
10	15	
TOTAL	110	

1. (10 points) V is the span of the given vectors in $\mathbb{R}^4$. Find orthonormal vectors whose span is V.

$$\bar{v}_1 = \begin{pmatrix} 0 \\ -1 \\ 2 \\ 0 \end{pmatrix}, \bar{v}_2 = \begin{pmatrix} 3 \\ 1 \\ 1 \\ 3\sqrt{2} \end{pmatrix}$$

2. (15 points) For the subspace V in the previous problem, give the matrix that projects $\mathbb{R}^4$ to V and the matrix that projects $\mathbb{R}^4$ to $V^\perp$.