NAME (print): _____

**No credit for unsupported answers will be given. Clearly indicate your final answer**

1. *[2pts]* Find the direction angles of the vector $\vec{a} = -2\vec{i} + 3\vec{j} + \vec{k}$.

2. *[2pts]* Find the scalar projection and vector projection of $\vec{b} = 2\vec{i} + 3\vec{j} - \vec{k}$ onto $\vec{a} = \vec{j} - 2\vec{k}$.

**[more problems on back]**

3. *[3pts]* Find two vectors orthogonal to both $< 2, 1, -1 >$ and $< 0, 1, 1 >$.

4. *[3pts]* Find the volume of the parallelepiped determined by the vectors $< 1, -1, 1 >$, $< 2, 0, -1 >$, and $< 0, -1, 3 >$.