Math 32A. Quiz 1b January 19, 2006

Solutions

1. Find the projection of the vector $\vec{a} = \vec{i} + 2\vec{j}$ onto the vector $\vec{b} = 2\vec{i} + 3\vec{j} + \vec{k}$.

Solution: The projection is the vector

$$\text{proj}_{\vec{b}}\vec{a} = \frac{\vec{a} \cdot \vec{b}}{|\vec{b}|^2}\vec{b}.$$

In our case $\vec{a} \cdot \vec{b} = 2 + 6 = 8$ and $|\vec{b}|^2 = \vec{b} \cdot \vec{b} = 14$. Therefore

$$\text{proj}_{\vec{b}}\vec{a} = < 8/7, 12/7, 4/7 > .$$