

MA 2733

Worksheet 4 – September 13, 2013

Name _____

1. (a) How many vectors are there that are orthogonal to $\langle 1, 2 \rangle$ and have length 1?

(b) How many vectors are there that are orthogonal to $\langle 1, 2, 3 \rangle$ and have length 1?

(c) Find $\text{proj}_{\vec{i}} \langle 1, 2, 3 \rangle$ and $\text{proj}_{\langle 1, 2, 3 \rangle} \vec{i}$.

2. (a) If \vec{a} and \vec{b} are orthogonal, then $\text{proj}_{\vec{a}} \vec{b}$ is which of the following?
a) \vec{a} b) \vec{b} c) $\vec{a} + \vec{b}$ d) $\vec{a} - \vec{b}$ e) $\vec{0}$

(b) If \vec{a} and \vec{b} are parallel, then $\text{proj}_{\vec{a}} \vec{b}$ is which of the following?
a) \vec{a} b) \vec{b} c) $\vec{a} + \vec{b}$ d) $\vec{a} - \vec{b}$ e) $\vec{0}$

3. Suppose that \vec{v} and \vec{u} are vectors, and that $\vec{v} + \vec{u}$ is orthogonal to $\vec{v} - \vec{u}$. Show that $\|\vec{v}\| = \|\vec{u}\|$.