

# Math 4133 - Linear Algebra

## Quiz #13 - 2013.02.18

### Solutions

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1. Explain geometrically what  $\text{proj}_{\vec{v}}(\vec{w})$  means.

The projection of  $\vec{w}$  onto  $\vec{v}$  will give the 'portion' of  $\vec{w}$  which lies in the direction of  $\vec{v}$ .

2. How does one find the normal vector  $\vec{n}$  to a  $k$ -dimensional plane?

Any  $k$ -dimensional plane can be expressed in the form  $a_1x_1 + a_2x_2 + \cdots + a_kx_k = b$ , for scalars  $a_1$  through  $a_k$  and  $b$ , and variables  $x_1$  through  $x_k$ . The normal to this plane is defined by  $n = \langle a_1, a_2, \dots, a_k \rangle$ .