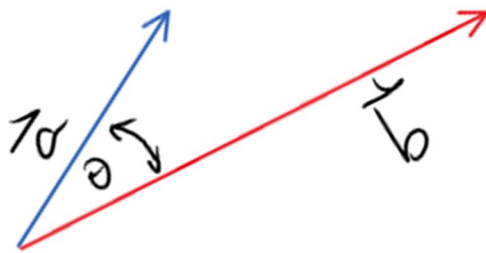


7.5b Projections: Scalar and Vector (2)

Vector Projections

Recall that given two vectors $\vec{a}$ and $\vec{b}$ we can find how much “ $\vec{a}$ -ness” there is along the vector $\vec{b}$ (or vice versa).

Picture



We can **construct** a **vector** along $\vec{b}$ with a length (magnitude) of $\text{comp}_{\vec{b}} \vec{a}$. But to do this, we will need the “pure direction” of $\vec{b}$. We will need a **unit vector** along $\vec{b}$ which we can “scale” with the **scalar** $\text{comp}_{\vec{b}} \vec{a}$.

That is, we want to use the vector

Thus, a vector of length $\text{comp}_{\vec{a}} \vec{b}$ in the direction of $\vec{b}$ is given by

Example 7.5.3

Given $\vec{a} = (3, 5, -1)$ and points $B(2, -1, 3)$ and $C(5, 3, -2)$ determine the vector projection of $\vec{a}$ on $\overrightarrow{BC}$.

Example 7.5.4

Given $P(3, -4, -6)$ find the vector projection of $\overrightarrow{OP}$ onto the z-axis.

Class/Homework for Section 7.5b

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