

?01

A question about WS01 (4d).

When using the dot product, why does the \hat{i} and the \hat{j} go away?

$$\vec{A} \cdot \vec{B} = |\vec{A}| |\vec{B}| \cos(\theta_{\vec{A}, \vec{B}})$$

$$\hat{i} \cdot \hat{j} = |\hat{i}| |\hat{j}| \cos(90^\circ) = 1 \times 1 \times 0 = 0$$

the dot product is also written as $\vec{A} \cdot \vec{B} = A_x B_x + A_y B_y + A_z B_z$

so the angle between two vectors is obtained by solving

$$|\vec{A}| |\vec{B}| \cos(\theta_{\vec{A}, \vec{B}}) = A_x B_x + A_y B_y + A_z B_z \Rightarrow \cos(\theta_{\vec{A}, \vec{B}}) = \frac{A_x B_x + A_y B_y + A_z B_z}{|\vec{A}| |\vec{B}|}$$