

Vector A has magnitude 16.0 and vector B has magnitude 13.0. The scalar product of AB is 73.0 . What is the cross product of A and B.

**Solution:**

$$|\vec{A}| = 16.0, |\vec{B}| = 13.0 \text{ and } (\vec{A}, \vec{B}) = 73.0$$

The cross product of A and B is

$$[\vec{A}, \vec{B}] = |\vec{A}| \cdot |\vec{B}| \cdot \sin\alpha,$$

where  $\alpha$  – is an angle between  $\vec{A}$  and  $\vec{B}$ .

$$(\vec{A}, \vec{B}) = |\vec{A}| \cdot |\vec{B}| \cdot \cos\alpha \rightarrow \cos\alpha = \frac{(\vec{A}, \vec{B})}{|\vec{A}| \cdot |\vec{B}|} = \frac{73}{13 \cdot 16} = 0.351 \rightarrow \alpha = 69,452^\circ$$

$$[\vec{A}, \vec{B}] = |\vec{A}| \cdot |\vec{B}| \cdot \sin\alpha = 16 \cdot 13 \cdot \sin(69,452^\circ) = 68,769$$

**Answer:**  $[\vec{A}, \vec{B}] = 68,769$ .