

**Problem statement** \* Suppose that  $\vec{v}$  is a vector in  $\mathbf{R}^3$  which is not the zero vector.

a) If  $\vec{v} \cdot \vec{w} = \vec{v} \cdot \vec{q}$ , must it be true that  $\vec{w} = \vec{q}$ ?

b) If  $\vec{v} \times \vec{w} = \vec{v} \times \vec{q}$ , must it be true that  $\vec{w} = \vec{q}$ ?

c) If  $\vec{v} \cdot \vec{w} = \vec{v} \cdot \vec{q}$  and  $\vec{v} \times \vec{w} = \vec{v} \times \vec{q}$ , must it be true that  $\vec{w} = \vec{q}$ ?

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\* This problem resembles problems in several textbooks.