Homework 1 - Tensors

Q1.1. Draw diagrams illustrating

(a) $\vec{v}$, $2\vec{v}$ and $-\vec{v}$

(b) $\vec{\vec{v}}$, $2\vec{\vec{v}}$ and $-\vec{\vec{v}}$

(c) $\underline{\omega}$, $2\underline{\omega}$ and $-\underline{\omega}$

(d) $\underline{\underline{\omega}}$, $2\underline{\underline{\omega}}$ and $-\underline{\underline{\omega}}$

in two dimensions.

Q1.2. Draw diagrams illustrating

(a) $\vec{v} \cdot \underline{\underline{\omega}}$

(b) $\underline{\underline{\omega}} \cdot \vec{v}$

(c) $\underline{\omega} \cdot \vec{\vec{v}}$

(d) $\vec{\vec{v}} \cdot \underline{\omega}$

in two dimensions.

Q1.3. Write down the Lorentz force law, expressing every tensor in its natural form. Draw a diagram illustrating your answer.