

## Homework 2 - Tensor algebra

Q2.1. Use diagrammatic methods to show that

$$\vec{a} \cdot (\underline{b} \wedge \underline{c}) = (\vec{a} \cdot \underline{b}) \underline{c} - (\vec{a} \cdot \underline{c}) \underline{b} \quad (\text{Q2.1.1})$$

Q2.2. Using Eq. (1.1.22), show that

(a)

$$(\underline{\omega} \wedge \underline{\sigma}) \cdot (\vec{u} \wedge \vec{v}) = (\underline{\omega} \cdot \vec{u}) (\underline{\sigma} \cdot \vec{v}) - (\underline{\omega} \cdot \vec{v}) (\underline{\sigma} \cdot \vec{u}) \quad (\text{Q2.2.1})$$

(b)

$$\underline{\sigma} \cdot (\vec{u} \wedge \vec{v} \wedge \vec{w}) = (\underline{\sigma} \cdot \vec{u}) \vec{v} \wedge \vec{w} + (\underline{\sigma} \cdot \vec{v}) \vec{w} \wedge \vec{u} + (\underline{\sigma} \cdot \vec{w}) \vec{u} \wedge \vec{v} \quad (\text{Q2.2.2})$$