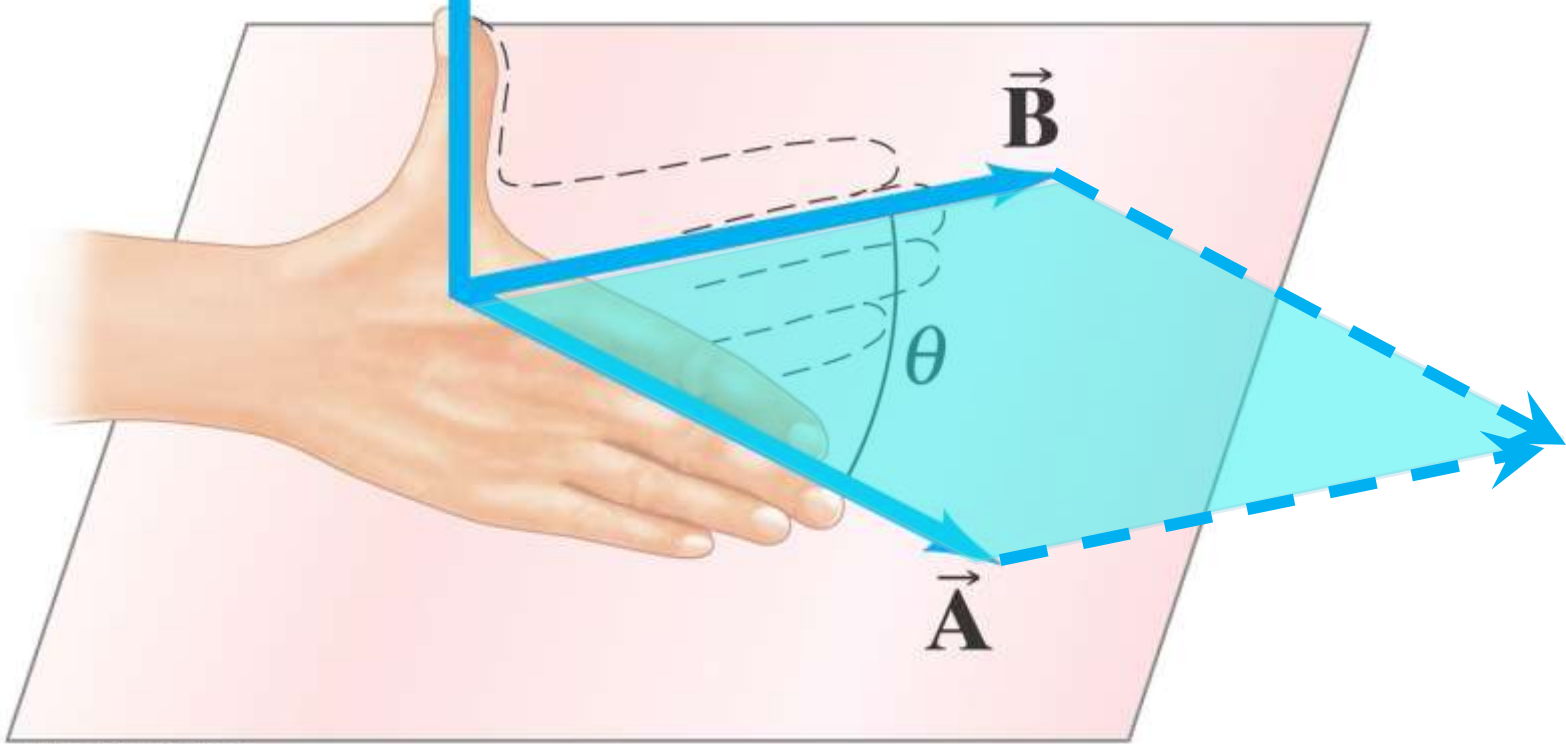
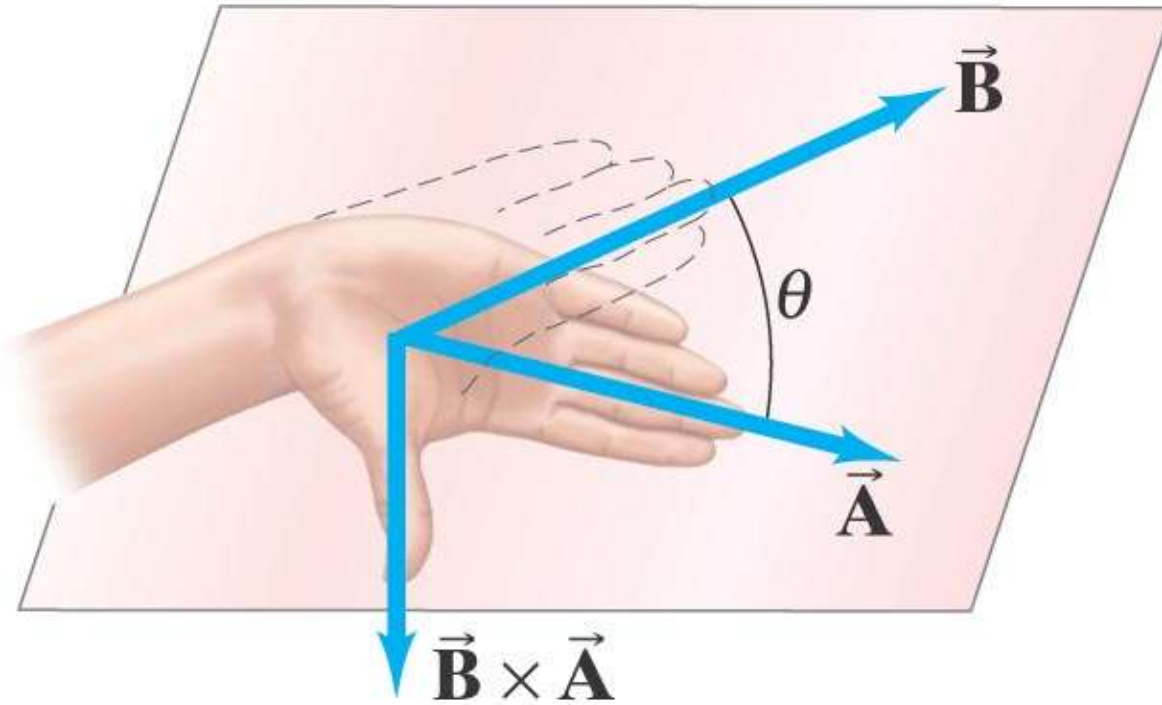


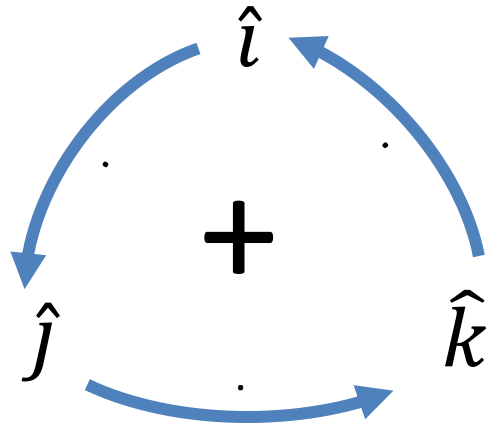
$$\vec{C} = \vec{A} \times \vec{B}$$

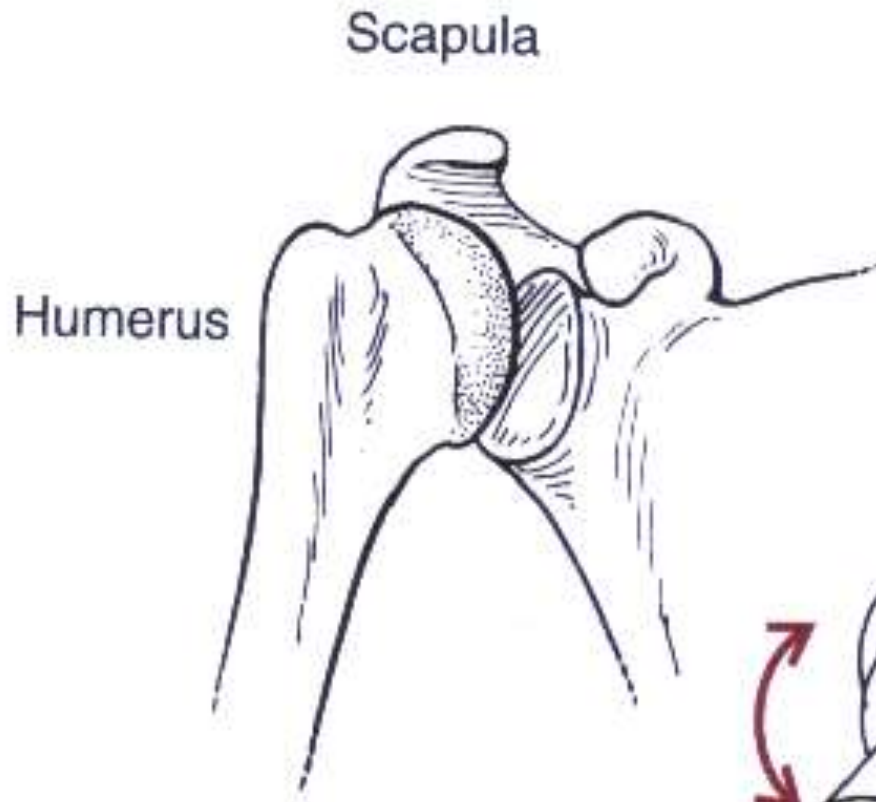




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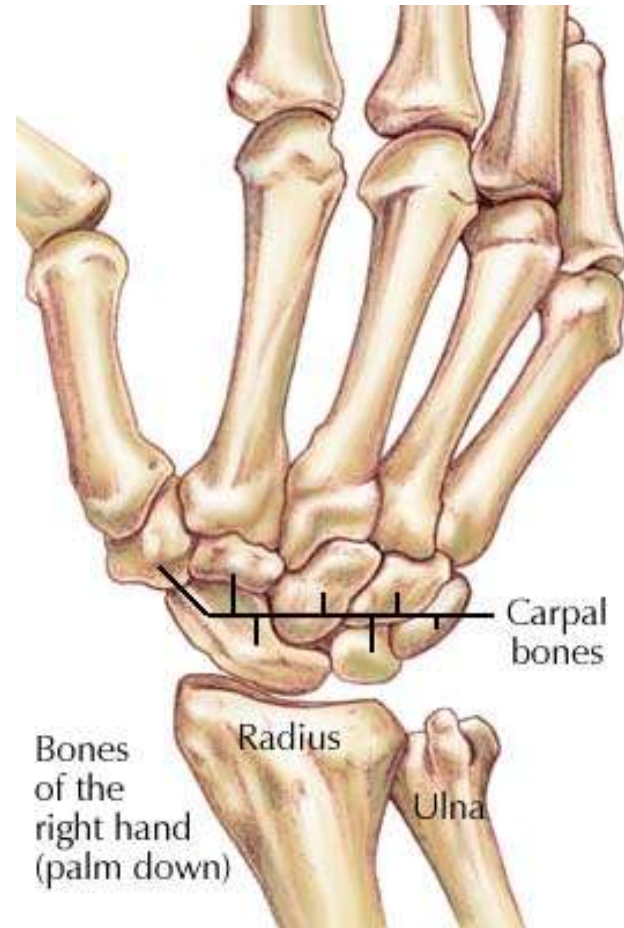
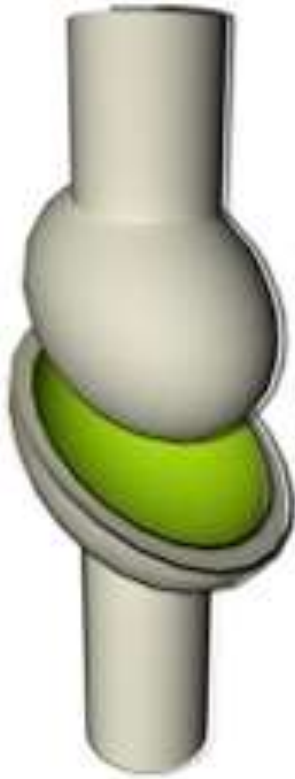
RHR and unit vectors





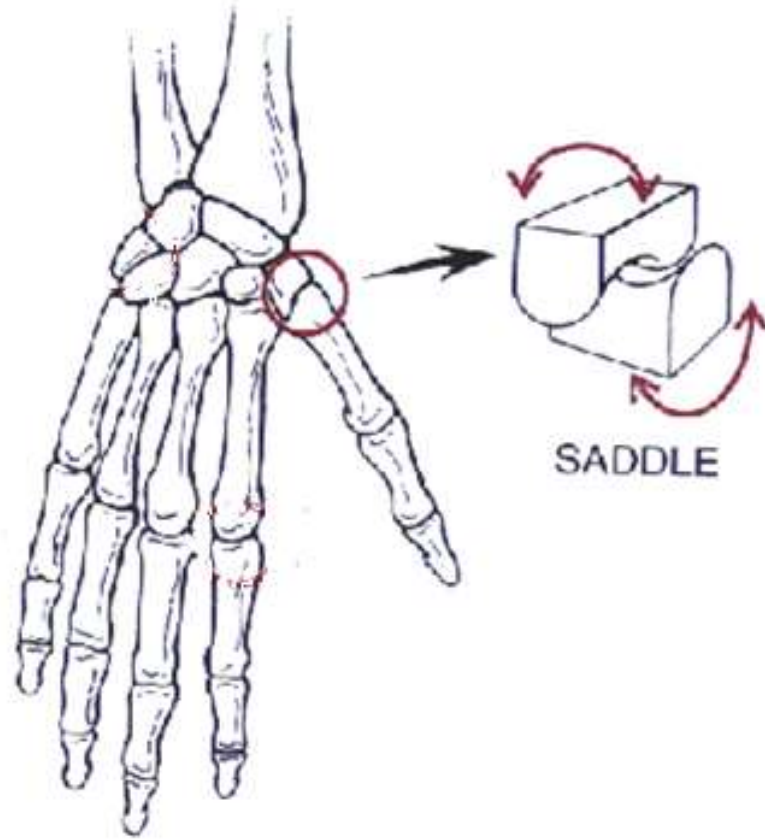
BALL and SOCKET

- Example – Shoulder (shown) and hip
- 3 rotational degrees of freedom



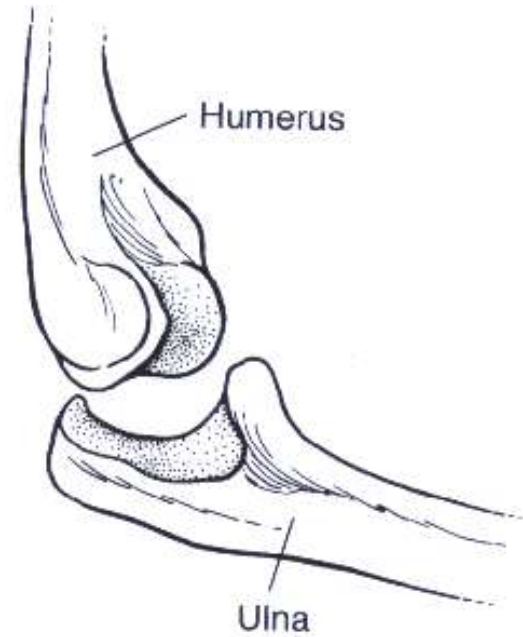
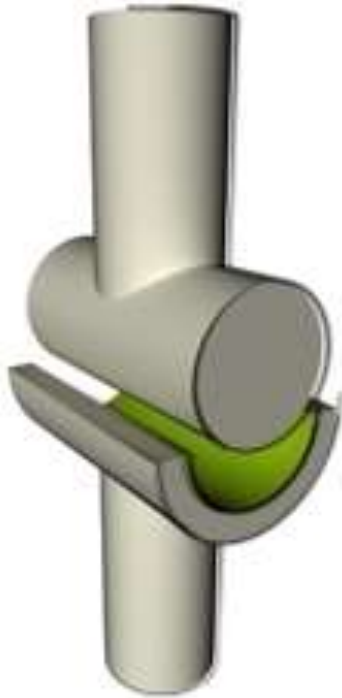
Ellipsoid Joint

- Example – Wrists (shown) and ankles
- 2 rotational degrees of freedom



Saddle Joint

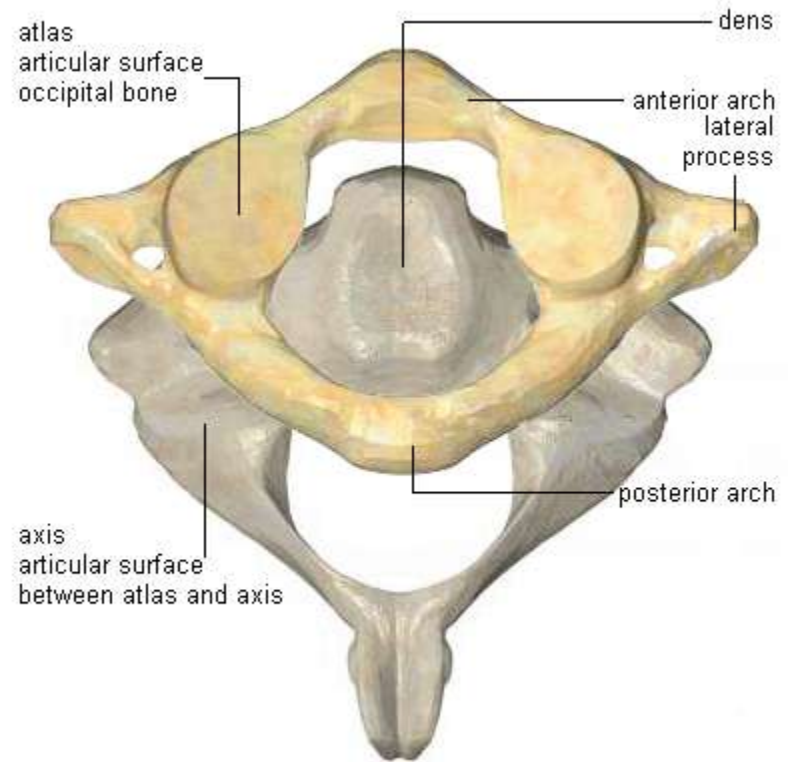
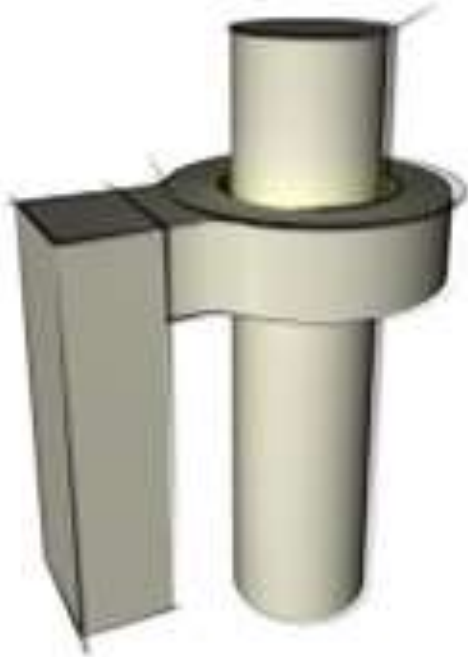
- Example – Thumb (shown)
- 2 rotational degrees of freedom



T

Hinge

- Example – Elbows (shown), knees, and fingers
- 1 rotational degree of freedom



Pivot Joint

- Example – Upper Neck Vertebrae (shown) and forearm (radius/ulna)
- 1 rotational degree of freedom



- Muscles can only contract about 20% of length
- Muscles must be attached near joints