$$P \xrightarrow{P = P_A} A \xrightarrow{A \perp B} B \xrightarrow{P_B = P^*} P^*$$

$$d\text{-dimensional} \in \mathbb{R}^{d \times n} \in \mathbb{R}^{(n - (d+1)) \times n} \quad (n - (d+1)) \text{-dimensional}$$
centroid at $\mathbf{0}$