Definition (Diagonal function)

Define the *diagonal function* $\mathrm{diag}_{\mathbf{P}} : \mathbf{P} \to \mathbf{P} \times \mathbf{P}$:

$$\mathrm{diag}_{\mathbf{P}} : \mathbf{P} \to \mathbf{P} \times \mathbf{P},$$

$$p \mapsto \langle p, p \rangle.$$