$$q = \sum_{i=0}^{n-1} \lambda_i \mathbb{P}_i \in M$$

$$-q = \sum_{i=0}^{n-1} \lambda_i \mathbb{P}_i$$

$\leq n \Longrightarrow (n+1)$

$$\sum_{i=0}^{n+1} \lambda_i \mathbb{P}_i$$

$$\sum_{i=0}^{n+1} \lambda_i = 1$$

$-q + P_n + \mathbb{P}_{n+1} \overset{?}{\in}$

$\qquad\quad \|$

$$(-1)q + 2\left(\tfrac{1}{2}\mathbb{P}_n + \tfrac{1}{2}\mathbb{P}_{n+1}\right) \in M$$

$\in M \qquad\qquad \in M$

a) $\exists \lambda_{i_0} \neq 1 \qquad \lambda_{i_0} = \lambda_0$

$$\sum_{i=1}^{n+1} \frac{\lambda_i}{1-\lambda_0} = \frac{\sum_{i=1}^{n+1} \lambda_i}{1-\lambda_0} = \frac{1-\lambda_0}{1-\lambda_0} = 1$$

$$\sum_{i=1}^{n+1} \frac{\lambda_i}{1-\lambda_0} \mathbb{P}_i \in M$$

$\in M$

$P_0, P_1 \in M \quad \lambda \in K \quad \overset{?}{\Longrightarrow} \quad \lambda P_0 + (1-\lambda) P_1 \in M \; ?$

$P_0 = P + \underset{\in S}{u_0}, \quad P_1 = P + \underset{\in S}{u_1}$

$\underline{\lambda (p + u_0)} + \underline{(1-\lambda)(p + u_1)} = P + \big(\underbrace{\underset{\in S}{\lambda u_0} + \underset{\in S}{(1-\lambda) u_1}}_{\in S} \big)$

$q - p \in S$ S4

$\in \Lambda_q$

M_i AP $\quad i \in I$

$\bigcap\limits_{i\in I} M_i \neq \emptyset$

$\Downarrow$

$p, q, \lambda \in \mathbb{K} \quad \overset{?}{\Longrightarrow} \quad \overbrace{(1-\lambda)\underset{\in M_i}{p} + \lambda \underset{\in M_i}{q}}^{M_i} \in \bigcap\limits_{i\in I} M_i .$

$$D_u \cap \Big(\bigcap_{i \in I} M_i \Big) = \bigcap_{i \in I} D_u \cap (M_i)$$

$$\| $$

$$\{ q - p \;:\; q \in \bigcap M_i \} \subseteq \bigcap_{i \in I} D_u \cap (M_i)$$

$$\Downarrow$$

$$u$$

$$p \in \underline{\underline{\bigcap M_i}}$$

$$p + u \in M_i \quad \forall\, i \in I$$

$$q = p + u \in \bigcap_{i \in I} M_i$$

$$1_n M + D_{in} N = V \overset{?}{\Longrightarrow} M \cap N \neq \emptyset$$

$$p \in M, \quad q \in N$$

$$\underbrace{q - p}_{\in V} = u = \underbrace{u_0}_{\in D_{in} M} + \underbrace{u_1}_{\in D_{in} N}$$

$$\cdot\ u_1 \in$$

$$\sum \underbrace{\lambda_i v_i}_{\in D_{in} M} + \sum \underbrace{\eta_j u_j}_{\in D_{in} N}$$

$$\underbrace{q + (-u_1)}_{\in N} = \underbrace{p + u_0}_{\in M}$$

$$M \sqcup N = M + D_{\cap} N = p + (D_{\cap} M + D_{\cap} N)$$

$$q \in M \sqcup N \quad \subseteq \quad \in M \cap N$$

$$q = \sum_{i=1}^{n} \lambda_i \underbrace{q_i}_{\in M} + \sum_{j=1}^{m} \alpha_j \underbrace{r_j}_{\in N}$$

$$\sum_{i=1}^{n} \lambda_i + \sum_{j=1}^{m} \alpha_j = 1 \qquad q = p + (q - p)$$

$$q - p = \sum \lambda_i \underbrace{(q_i - p)}_{\in D_{\cap} M} + \sum \alpha_j \underbrace{(r_j - p)}_{\in D_{\cap} N} \in D_{\cap} M + D_{\cap} N$$

$$\overset{\psi}{q}$$

$$q = \big(\underbrace{\mathbb{p} + \mathbb{u}}_{\in P\cap M}\big) + \underbrace{\mathbb{v}}_{\in P\cap N} = 1\underbrace{\big(\mathbb{p} + \mathbb{u}\big)}_{\substack{\in M \\ \in M\cup N}} + 1\underbrace{\big(\mathbb{p} + \mathbb{v}\big)}_{\substack{\in N \\ \in M\cup N}} - \underbrace{\mathbb{p}}_{\substack{\in M \\ \in M\cup N}}$$

$M \cap N = \emptyset \qquad p \in M,\ q \in N \qquad \lambda + \alpha = 1$

$p_i = p + u_i \qquad q_j = q + v_j \qquad \sum \lambda_i = \lambda$

$\underset{p_i \in M}{\cap}$ $\qquad \sum \alpha_j = \alpha$

$$\sum_i \lambda_i (p + u_i) + \sum_j \alpha_j (q + v_j) = \qquad 1 - \lambda = \alpha$$

$$= \underbrace{\sum_i \lambda_i p + (1-\lambda) p}_{p} - (1-\lambda) p + \sum \alpha_j q + \sum \alpha_j v_j$$

$$+ \underbrace{\sum \lambda_i u_i}_{\in D_1 M} \qquad \sum \alpha_j (q - p) = \alpha (q - p) \qquad \in D_1 N$$