

$g = g_1 g_2 g_3 g_4$

$g = (\alpha_0 g_1 \bar{\alpha}_1)(\alpha_1 g_2 \bar{\alpha}_2)(\alpha_2 g_3 \bar{\alpha}_3)(\alpha_3 g_4 \bar{\alpha}_4)$
 where α_0 and α_4 are constant maps.

$g = (\alpha_0 g_1 \bar{\alpha}_1)(\alpha_1 g_2 \bar{\alpha}_2)(\alpha_2 g_3 \bar{\alpha}_3)(\alpha_3 g_4 \bar{\alpha}_4)$
 where $(\alpha_0 g_1 \bar{\alpha}_1), (\alpha_1 g_2 \bar{\alpha}_2) \in \pi_1(U)$ and $(\alpha_2 g_3 \bar{\alpha}_3), (\alpha_3 g_4 \bar{\alpha}_4) \in \pi_1(V)$

$g = (\alpha_0 g_1 \bar{\alpha}_1)(\alpha_1 g_2 \bar{\alpha}_2)(\alpha_2 g_3 \bar{\alpha}_3)(\alpha_3 g_4 \bar{\alpha}_4)$
 where $(\alpha_0 g_1 \bar{\alpha}_1) \in \pi_1(U)$ and $(\alpha_1 g_2 \bar{\alpha}_2), (\alpha_2 g_3 \bar{\alpha}_3), (\alpha_3 g_4 \bar{\alpha}_4) \in \pi_1(V)$

$g = (\alpha_0 g_1 \bar{\alpha}_1)(\alpha_1 g_2 \bar{\alpha}_2)(\alpha_2 g_3 \bar{\alpha}_3)(\alpha_3 g_4 \bar{\alpha}_4)$
 where $(\alpha_0 g_1 \bar{\alpha}_1 \alpha_1 g_2 \bar{\alpha}_2) = (\alpha_0 g_1 g_2 \bar{\alpha}_2) \in \pi_1(U)$ and $(\alpha_2 g_3 g_4 \bar{\alpha}_4) \in \pi_1(V)$

$g = (\alpha_0 g_1 \bar{\alpha}_1)(\alpha_1 g_2 \bar{\alpha}_2)(\alpha_2 g_3 \bar{\alpha}_3)(\alpha_3 g_4 \bar{\alpha}_4)$
 where $(\alpha_0 g_1 \bar{\alpha}_1) \in \pi_1(U)$ and $(\alpha_1 g_2 g_3 g_4 \bar{\alpha}_4) \in \pi_1(V)$

$g = (\alpha_0 g_1 \bar{\beta}_1)(\beta_1 g_2 \bar{\alpha}_2)(\alpha_2 g_3 \bar{\alpha}_3)(\alpha_3 g_4 \bar{\alpha}_4)$
 where $(\alpha_0 g_1 \bar{\beta}_1) \in \pi_1(U)$ and $(\beta_1 g_2 g_3 g_4 \bar{\alpha}_4) \in \pi_1(V)$

$\pi_1(U) = \langle a, b \rangle$ $[g]_U = b$
 $\pi_1(V) = \langle e \rangle$ $[g]_V = e$ $[g]_{U \cup V} = e$
 $\pi_1(U \cap V) = \langle b \rangle$ $[g]_{U \cap V} = b$

$\pi_1(U \cap V) \begin{matrix} \xrightarrow{i_1} \pi_1(U) \\ \xrightarrow{i_2} \pi_1(V) \end{matrix} \begin{matrix} \xrightarrow{iU_4} \pi_1(X) \\ \xrightarrow{iV_4} \pi_1(V) \end{matrix}$

$[g]_U = b$
 $[g]_V = e$ $[g]_{U \cup V} = e$
 $[g]_{U \cap V} = b$