$$\begin{cases} U(x_1, x_2) = (\alpha x_1^{\beta} + (1-\alpha)x_2^{\beta})^{1/\beta} \longrightarrow \max_{x_1, x_2} \\ I = x_1 P_1 + x_2 P_2 \\ 1 > \alpha > 0 \end{cases}$$

$$U'_{x_1} = \frac{(\alpha\beta x_1^{\beta-1} - \frac{(1-\alpha)\beta P_1 (\frac{I-P_1 x_1}{P_2})^{\beta-1}}{P_2})(\alpha x_1^{\beta} + (1-\alpha)(\frac{I-P_1 x_1}{P_2})^{\beta})^{\beta^{-1}-1}}{\beta} = 0$$

$$\left[\begin{array}{c} \alpha\beta x_1^{\beta-1} - P_2^{-1}(1-\alpha)\beta P_1 (\frac{I-P_1 x_1}{P_2})^{\beta-1} = 0 \\ \alpha x_1^{\beta} + (1-\alpha)(\frac{I-P_1 x_1}{P_2})^{\beta} = 0 \end{array} \right.$$

$$\alpha\beta x_1^{\beta-1} P_2 = (1-\alpha)\beta P_1 x_2^{\beta-1}$$

$$\frac{x_1}{x_2} = (\frac{(1-\alpha)P_1}{\alpha P_2})^{\frac{1}{\beta-1}}$$