

$$\text{Max } U = f(x, Y) = x^{\frac{2}{3}} Y^{\frac{1}{3}}$$

$$\text{subject to } 300 = 10x + 20Y \Rightarrow$$

$$\text{最適: } x=20 \quad Y=5$$

$$\text{Max } U = f(x, Y) = x^{\frac{2}{3}} Y^{\frac{1}{3}}$$

$$\text{subject to } 300 = 20x + 20Y$$

$$\text{MRS}_{XY} = \frac{2Y}{x} = \frac{P_X}{P_Y} = \frac{20}{20} = 1 \Rightarrow$$

$$Y = \frac{1}{2}x$$

$$\text{最適 } x=10 \quad Y=5$$

$$U = x^{\frac{2}{3}} Y^{\frac{1}{3}} = 20^{\frac{2}{3}} 5^{\frac{1}{3}} = 2000^{\frac{1}{3}}$$

$$Y = \frac{1}{2}x \text{ 代入}$$

$$U = x^{\frac{2}{3}} Y^{\frac{1}{3}} = \left(\frac{1}{2}x\right)^{\frac{1}{3}} = 2000^{\frac{1}{3}}$$

$$x = 4000^{\frac{1}{3}} \approx 15.874$$

$$Y = 500^{\frac{1}{3}}$$

$$\text{替代} \Rightarrow (x, Y) \text{ 从 } (20, 5) \text{ 到 } (4000^{\frac{1}{3}}, 500^{\frac{1}{3}})$$

$$x \text{ 的替代效果} = (4000)^{\frac{1}{3}} - 20 < 0$$

$$\text{所得 } (x, Y) = [4000^{\frac{1}{3}}, 500^{\frac{1}{3}}] \text{ 到 } [10, 5]$$