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Content: 期中考 (二)

一.

1. d
2. a
3. d
4. b
5. c
6. d
7. a
8. c
9. d
10. d
11. c
12. b
13. d
14. c
15. b
16. a

Content: 期中考 (二)

二.

1. (A) 效用 $U_0$ $U_1$ $U_0 > U_1$ 數量 0

(B) 烏龍茶 10 5 $U_1 > U_0$ $U_1$ $U_0$ 0 5 10 紅茶

效用函數 $= U = X + Y$

2. ① $U = f(x,y) = x^{\frac{1}{3}} y^{\frac{2}{3}}$

$300 = 20x + 10y$

代入 $\begin{cases} \text{Max } U = f(x,y) = x^{\frac{1}{3}} y^{\frac{2}{3}} \\ \text{subject to } 300 = 20x + 10y \\ MRS_{xy} = \frac{\frac{1}{3}x^{\frac{1}{3}}y^{\frac{2}{3}}}{\frac{2}{3}x^{\frac{1}{3}}y^{\frac{1}{3}}} = \frac{P_x}{P_y} = 2 \end{cases}$ ⇒ 5杯咖啡 20個包子 #

$\frac{Y}{2x} = 2$, $y = 4x$ ⇒ $60x = 300$, $\begin{cases} x = 5 \\ y = 20 \end{cases}$

② $\text{Max } U = f(x,y) = x + 3y$

subject to $300 = 20x + 10y$

$MRS_{xy} = \frac{1}{3} < 2$, $\begin{cases} x = 0 \\ y = 30 \end{cases}$ ⇒ 0杯咖啡 30個包子 #

③ $\text{Max } U = f(x,y) = \min(x,y)$

subject to $300 = 20x + 10y$

$x = 2y$

$300 = 50y$, $\begin{cases} x = 12 \\ y = 6 \end{cases}$ ⇒ 12杯咖啡 6個包子 #

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

subject to $300 = 20x + 10y$

最適消費量為: $x = 5$, $y = 20$

↓ 咖啡 $P_x$ 20 → 10

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

subject to $300 = 10x + 10y$

$MRS_{xy} = \frac{y}{2x} = \frac{P_x}{P_y} = \frac{10}{10} = 1$

⇒ $y = 2x$ ⇒ $x = 5$, $y = 10$

(原來) 總效用 $= U = x^{\frac{1}{3}} y^{\frac{2}{3}} = (5)^{\frac{1}{3}} (20)^{\frac{2}{3}} = (2000)^{\frac{1}{3}}$

(後來) $y = 2x$ 代入 $U = (2000)^{\frac{1}{3}}$

$U = x^{\frac{1}{3}} y^{\frac{2}{3}} = (2x^2)^{\frac{1}{3}} = (2000)^{\frac{1}{3}}$

可得 $x = (500)^{\frac{1}{3}}$, $y = (4000)^{\frac{1}{3}} \approx 15.8740$

① 替代效果 由 $(x,y) = (5,20)$ 至 $[(500)^{\frac{1}{3}}, (4000)^{\frac{1}{3}}]$

$x$ 的替代效果 $= (500)^{\frac{1}{3}} - 5 < 0$ #

② 所得效果 由 $(x,y) = [(500)^{\frac{1}{3}}, (4000)^{\frac{1}{3}}]$ 至 $(5,10)$ #

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

subject to $300 = 20x + 10y$

① $MRS_{xy} = \frac{y}{2x} = \frac{P_x}{P_y} = \frac{20}{10}$ ⇒ $10y = 40x$ ⇒ $x = \frac{1}{4}y$ #

② $y = 4x$ 代入 $20x + 10y = M$ 預算限制中

⇒ $20x + 40x = M$ ⇒ $60x = M$ ⇒ $x = \frac{M}{60}$ #

③ 價格消費 $MRS_{xy} = \frac{y}{2x} = \frac{P_x}{P_y}$

$x = \frac{yP_y}{2xP_x}$ #

④ $\text{Max } U = f(x,y) = x^{\frac{1}{3}} y^{\frac{2}{3}}$

subject to $300 = P_x x + 10y$

$MRS_{xy} = \frac{y}{2x} = \frac{P_x}{10}$

$10y = 2x \cdot P_x$

$y = \frac{P_x}{5} x$

$300 = P_x \cdot x + 10\left(\frac{P_x}{5}\right)x$

$300 = 3P_x x$

$x = \frac{100}{P_x}$ #