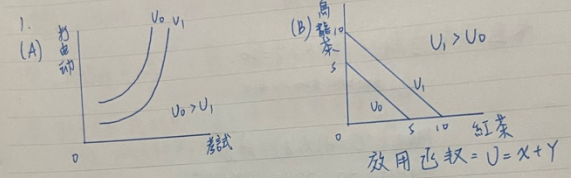


Content: 期中考(=)

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(=)



2. (1) $U = f(x, y) = x^{\frac{1}{2}} y^{\frac{2}{3}}$
 $300 = 20x + 10y$
 $\text{Max } U = f(x, y) = x^{\frac{1}{2}} y^{\frac{2}{3}}$
 $\text{subject to } 300 = 20x + 10y$
 $\text{MRS}_{xy} = \frac{\frac{1}{2} x^{-\frac{1}{2}} y^{\frac{2}{3}}}{\frac{2}{3} x^{\frac{1}{2}} y^{-\frac{1}{3}}} = \frac{\frac{1}{2} y^{\frac{5}{3}}}{\frac{2}{3} x^{\frac{3}{2}}} = \frac{3y^{\frac{5}{3}}}{4x^{\frac{3}{2}}} = \frac{p_x}{p_y} = 2$
 $\Rightarrow 5 \text{ 杯咖啡}, 20 \text{ 個包子}$
 $\frac{y}{x} = 2, y = 4x \Rightarrow 60x = 300, x = 5, y = 20$

(2) $\text{Max } U = f(x, y) = x + y$
 $\text{subject to } 300 = 20x + 10y$
 $\text{MRS}_{xy} = \frac{1}{1} = \frac{p_x}{p_y} = 2$
 $\Rightarrow 0 \text{ 杯咖啡}, 30 \text{ 個包子}$
 $x = 0, y = 30$

(3) $\text{Max } U = f(x, y) = \min(x, y)$
 $\text{subject to } 300 = 20x + 10y$
 $x = y$
 $300 = 50y, y = 6, x = 12$
 $\Rightarrow 12 \text{ 杯咖啡}, 6 \text{ 個包子}$

3. $\text{Max } U = f(x, y) = x^{\frac{1}{2}} y^{\frac{2}{3}}$
 $\text{subject to } 300 = 20x + 10y$

最適消費量為 $x = 5, y = 20$

11. 咖啡 20 → 10

$\text{Max } U = f(x, y) = x^{\frac{1}{2}} y^{\frac{2}{3}}$
 $\text{subject to } 300 = 10x + 10y$
 $\text{MRS}_{xy} = \frac{\frac{1}{2} x^{-\frac{1}{2}} y^{\frac{2}{3}}}{\frac{2}{3} x^{\frac{1}{2}} y^{-\frac{1}{3}}} = \frac{3y^{\frac{5}{3}}}{4x^{\frac{3}{2}}} = \frac{p_x}{p_y} = 1$
 $\Rightarrow y = 2x \Rightarrow x = 5, y = 10$

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

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

$U = x^{\frac{1}{2}} y^{\frac{2}{3}} = (2x)^{\frac{1}{2}} = (2000)^{\frac{1}{3}}$
 $\text{可得 } x = (500)^{\frac{1}{2}}, y = (4000)^{\frac{1}{3}} \approx 15.87401$

① 替代效果由 $(x, y) = (5, 20)$ 至 $[(500)^{\frac{1}{2}}, (4000)^{\frac{1}{3}}]$

x 的替代效果 $= (500)^{\frac{1}{2}} - 5 < 0$

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

Content:

4. $\text{Max } U = f(x, y) = x^{\frac{1}{2}} y^{\frac{2}{3}}$
 $\text{subject to } 300 = 20x + 10y$

① $\text{MRS}_{xy} = \frac{p_x}{p_y} = \frac{20}{10} = 2 \Rightarrow 10y = 40x \Rightarrow x = \frac{1}{4}y$

② $y = 4x$ 代入 $20x + 10y = M$ 預算限制中
 $\Rightarrow 20x + 40x = M \Rightarrow 60x = M \Rightarrow x = \frac{M}{60}$

③ 所得效果 $\text{MRS}_{xy} = \frac{p_x}{p_y}$
 $x = \frac{y p_x}{2 p_y}$

④ $\text{Max } U = f(x, y) = x^{\frac{1}{2}} y^{\frac{2}{3}}$
 $\text{subject to } 300 = p_x x + 10y$

$\text{MRS}_{xy} = \frac{p_x}{p_y} = \frac{p_x}{10}$

$10y = 2x p_x$

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

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

$300 = 3 p_x x$

$x = \frac{100}{p_x}$

