2.

消費決策

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

$$subject\ to \quad 300 = 10X + 20Y$$

最適消費量

$$X = 20 \ , \ Y = 5$$

奶茶提高20元消費決策

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

$$subject\ to \quad 300 = 20X + 20Y$$

最適消費條件

$$MRS_{XY} = \frac{2Y}{X} = \frac{P_X}{P_Y} = \frac{20}{20} = 1$$

$$\rightarrow Y = \frac{1}{2} X$$

$$\rightarrow X = 10 \ , \ Y = 5$$

1. 全媒分二 ，一為網路科技為融合，匯流過去不同媒体

總效果分為代效果與所得效果

$$U = X^{\frac{2}{3}} Y^{\frac{1}{3}} = (20)^{\frac{2}{3}} (5)^{\frac{1}{3}} = (2000)^{\frac{1}{3}}$$

$$Y = \frac{1}{2} X \text{ 代入 } U = (2000)^{\frac{1}{3}}$$

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

可得 $X = (4000)^{\frac{1}{3}} \approx 15.87401$ $Y = (500)^{\frac{1}{3}}$

① 替代效果由 $(X,Y) = (20,5)$ 到 $[(4,000)^{\frac{1}{3}}, (500)^{\frac{1}{3}}]$

X 的替代效果 $= (4,000)^{\frac{1}{3}} - 20 < 0$

② 所得效果由 $(X,Y) = [(4,000)^{\frac{1}{3}}, (500)^{\frac{1}{3}}]$ 到 $(10,5)$

X 的所得效果 $= (4,000)^{\frac{1}{3}} - 10 > 0$.