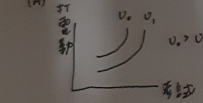
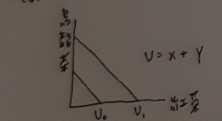
二、1.

(A)



(B)



2. (1) $MRS_{XY} = \frac{\frac{1}{2}X^{-\frac{1}{2}}Y^{\frac{1}{2}}}{\frac{1}{2}X^{\frac{1}{2}}Y^{-\frac{1}{2}}} \Rightarrow \frac{Y}{2X} = \frac{20}{10} \Rightarrow 4X = Y$

代入預算線 $20X + 40X = 300$

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

(2) $U = f(X,Y) = X + 2Y$

$300 = 20X + 10Y$

$MRS_{XY} = \frac{1}{2} < \frac{20}{10}$

$\Rightarrow X = 0,\ Y = 30$

(3) $U = f(X,Y) = \min(X, 2Y)$

$300 = 20X + 10Y$

$X = 2Y$ 代入 $\Rightarrow 300 = 40Y + 10Y$

$\Rightarrow Y = 6,\ X = 12$

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

$300 = 10X + 10Y$

$MRS_{XY} \Rightarrow \frac{10}{10} = \frac{Y}{2X} \Rightarrow Y = 2X \Rightarrow X = 10,\ Y = 20$

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

下跌 $\Rightarrow Y = 2X$ 代入 $2000^{\frac{1}{3}}$

$\Rightarrow (4X^2)^{\frac{1}{3}} = (2000)^{\frac{1}{3}}$

$\Rightarrow X^{\frac{2}{3}} = 500,\ \Rightarrow X = 500^{\frac{1}{2}},\ Y = 4000^{\frac{1}{2}}$

補償後：

由 $(X,Y) = [(500)^{\frac{1}{2}}, (4000)^{\frac{1}{2}}]$ 到 $(10,20)$

(2) 替代效果：

由 $(5,20)$ 到 $[(500)^{\frac{1}{2}}, (4000)^{\frac{1}{2}}]$

X's $= 500^{\frac{1}{2}} - 5 > 0$