NO.
DATE

Max $U = X^{\frac{2}{3}} Y^{\frac{1}{3}}$

s.t. $300 = 10X + 20Y$ —①

⇒ 內部解 $X^* \neq 0, Y^* \neq 0$.

永不滿足定理 $300 = 10X + 20Y$

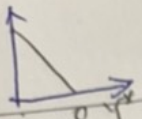
邊際效用均等，$\frac{MUX}{Px} = \frac{MUY}{PY}$

$$\frac{\frac{2}{3} X^{-\frac{1}{3}} Y^{\frac{1}{3}}}{\frac{1}{3} X^{\frac{2}{3}} Y^{-\frac{2}{3}}} = \frac{10}{20} \quad —②$$

$$\frac{2}{3} X^{-\frac{1}{3}} Y^{\frac{1}{3}} = \frac{10}{3} X^{\frac{2}{3}} Y^{-\frac{2}{3}}$$

$$Y = 4X$$

⇒ 化簡(2)，結果代入(1)，可得 $X^*, Y^*$




6 ① 設英文課程 x hr，電腦課程 y hr

~~400x + 600y = 12000~~

300 = 10x + 20y → 完

Max U = x + 3y

$MRS_{xy} = \frac{\frac{1}{2}x^{-\frac{1}{2}}y^{\frac{1}{2}}}{\frac{1}{2}x^{\frac{1}{2}}y^{-\frac{1}{2}}} = \frac{Px}{Py} = \frac{600}{400} = \frac{3}{2}$

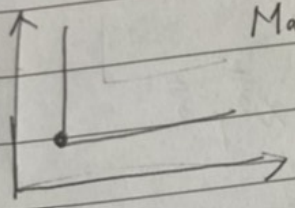
$\frac{3}{2}x^{\frac{1}{2}}y^{-\frac{1}{2}} = x^{-\frac{1}{2}}y^{\frac{1}{2}}$, $y^{\frac{1}{2}-\frac{1}{2}} = \frac{2}{3}x^{\frac{1}{2}-\frac{1}{2}}$

$y^{-1} = \frac{2}{3}x^{-1}$

$\frac{1}{y} = \frac{2}{3x}$ $3x = 2y$

$y = \frac{3}{2}x$

Max( Min(x, y) )



$400x + 600 \times \frac{3}{2}x = 12000$

$x = \frac{12000 - 900}{400} = \frac{11100}{400} = \frac{111}{4} = 27.75$

10杯 milk tea

10個漢堡

② ~~x + y ≤ 23~~

$400x + 600y = 12000$

$400 \times 27.75 + 600y = 12000$

$y = \frac{12000 - 11100}{600} = \frac{900}{600} = 1.5$

$\text{Max } U = x^{\frac{1}{2}}y^{\frac{1}{2}}$ ①

⇒ 內部解 ②

$\frac{\frac{1}{2}x^{-\frac{1}{2}}y^{\frac{1}{2}}}{\frac{1}{2}x^{\frac{1}{2}}y^{-\frac{1}{2}}} = \frac{400}{600}$ 化簡 $y = \frac{2}{3}x$ ③

將③代入① $x^* = 15$, $y^* = 10$