カ ①

$$MRS_{xy} = \frac{MU_x}{MU_y} = \frac{dy}{dx} = \frac{2XY}{X^2} = \frac{P_x}{P_y} = \frac{10}{20}$$

$$\Rightarrow X = 4Y$$

② $Y = \frac{1}{4}X$ 代入 $10X + 20Y = M$

$$X = \frac{M}{15}$$

③ X 的需求線為不同價格下 X 的消費選擇

$$Max: \quad U = f(X, Y) = X^2 Y$$

subject to $300 = P_x X + 20Y$

$$MRS_{xy} = \frac{2Y}{X} = \frac{P_x}{20} \Rightarrow \boxed{Y = \frac{P_x}{40} X}$$

$$300 = P_x X + 20 \left[\frac{P_x}{40} X \right] \Rightarrow X = \frac{200}{P_x}$$

④ X 為正斜率 是正常財（由恩格爾曲

線得知）