Week9

2.

① Max $U=f(x,y)=x^{\frac{2}{3}}y^{\frac{1}{3}}$

subject to $300=10x+20y$

$MRS_{xy}=\frac{MU_x}{MU_y}=\frac{P_x}{P_y}$ $\quad \frac{\frac{2}{3}x^{-\frac{1}{3}}y^{\frac{1}{3}}}{\frac{1}{3}x^{\frac{2}{3}}y^{-\frac{2}{3}}}=\frac{1}{2}$ $\quad 2\cdot x^{-1}\cdot y^{1}=\frac{1}{2}$

$300=40y+20y$ $\quad \frac{2y}{x}=\frac{1}{2}$

$y=5$ $\quad x=20$ $\quad x=4y$

② Max $U=f(x,y)=x^{\frac{2}{3}}y^{\frac{1}{3}}$

subject to $300=20x+20y$

$MRS_{xy}=\frac{2y}{x}=1 \quad 2y=x$

$300=40y+20y$

$x=10 \quad y=5$

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

$x=(4000)^{\frac{1}{3}}\approx 15.8740$

$y=(500)^{\frac{1}{3}}$

①替代效果 $(x,y)=(20,5)$ 到 $(4000^{\frac{1}{3}},500^{\frac{1}{3}})$

x 的替代效果 $=4000^{\frac{1}{3}}-20<0$