Econ 303 Exam #1

Solution

1) Combination of c and l which give an individual the same amount of utility [along an indifference curve, a consumer has the same utility level]

$$4^{1/2}\,0.25^{1/2} = 5^{1/2}\,0.2^{1/2} = 1$$

↳ indifferent ie: same utility

2) Combination of all possible c and l that are technically feasible

PPF: $C = Y - G$

$C = zN - G$ $\quad G = 1 \quad z = 2$

$\boxed{C = 2(1-l) - 1}$

$2 \times 0.5 - 1 = 0$ ie: $C = 0.2$ and $l = 0.5$ is not on the PPF

3) see class notes or

1) $MRS_{lc} = w$ 4) $G = T$
2) $MPN = w$
3) ~~$N^d = N^s$~~

1) consumer: max utility s.t. constraint given wage, π
2) firm: max profits given wage
3) market clear: • w is such that $N^s = N^d$
• π in 2) are same as π used in 1)
4) $G = T$

4) - no externalities
- no distortions
- no market power

→ see class notes + book

↳ ∴ 2 welfare theorems hold

competitive equ is the same as the planner's solution

in practice, it means that government policy cannot do better than the market solution unless there are externalities, distortions, or market power, etc...

5) 1) $MRS_{lc} = MRT_{lc} = MPN$ (optimality)

one or the other

ie: essentially, the value attached by consumers to leisure in term of consumption goods is the same as the value of an extra hour of work for firms

ie: consumers and firms trade at the same "price" or value

2) c and l are on the PPF (feasibility)

allocation is feasible

6) $$MRS_{lc} = \frac{\frac{\partial u}{\partial l}}{\frac{\partial u}{\partial c}} = \frac{\frac{1}{2} c^{1/2} l^{-1/2}}{1/2\, c^{-1/2} l^{1/2}} = \frac{c}{l}$$

$$MRT_{lc} = MPN = 2$$

$$\therefore \frac{c}{l} = 2$$

$$\boxed{c^* = 2l^*}$$

$PPF \Rightarrow \quad c = 2(1-\ell) - 1$

$$2\ell = 2(1-\ell) - 1$$

$$2\ell = 2 - 2\ell - 1$$

$$4\ell = 1$$

$$\boxed{\ell = 0.25}$$

$$\therefore \boxed{c = 0.5} \quad [c^* = 2\ell^*]$$

7) $W = MPN = 2 \qquad \boxed{w = 2}$

$\pi = Y - wN$

$\quad = 2(1-\ell^*) - 2(1-\ell^*)$

$\boxed{\pi = 0}$

$\boxed{P = 1} \rightarrow$ Walras law $\rightarrow$ can normalize one price since we have 2 markets

8) $MRS_{\ell c} = \frac{c}{\ell} = \frac{0.6}{0.2} = 3 > MPN = 2 = w$

$$MRS_{\ell c} > w$$

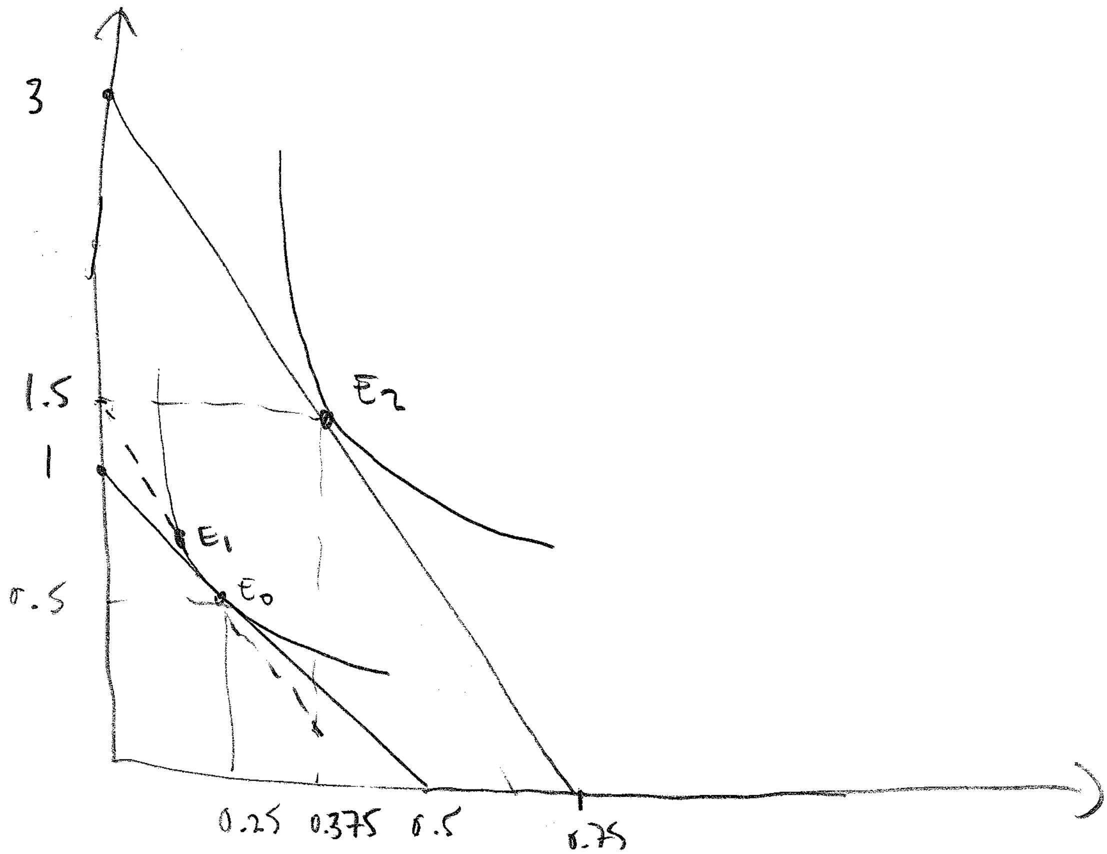
recall
$c + w\ell = wh + \pi - T \Leftarrow$
$\hookrightarrow$ w is the "price" of leisure

value attached to leisure exceed that on the market
$\Rightarrow$ purchase more leisure $\uparrow \ell$

a) $z=2$ to $z=4$

PPF ($z=2$) : $c = 2(1-\ell)-1 = 1-2\ell$

PPF ($z=4$) : $c = 4(1-\ell)-1 = 3-4\ell$



$E_0 \rightarrow E_1$ (substitution effect)
$E_1 \rightarrow E_2$ (income effect)

to know that E_2 has higher ℓ [income effect dominates]
we need to recalculate equilibrium

ie: $MRS_{\ell c} = MPN$ $\quad c^* = 4\ell^*$

lands on PPF $\quad 4\ell^* = 4(1-\ell)-1$

$\ell^* = 3/8 = 0.375$ → income effect dominates

$c = 1.5$

10) $\downarrow$ spending $(G=0)$

→ can show with graph that $\downarrow G \Rightarrow \uparrow$ welfare

→ or, since $CE = SPS$, government cannot do better than the market

$\Rightarrow$ $G=0$ is better

→ or consumer does not value G

↳ ∴ optimal value $= 0$