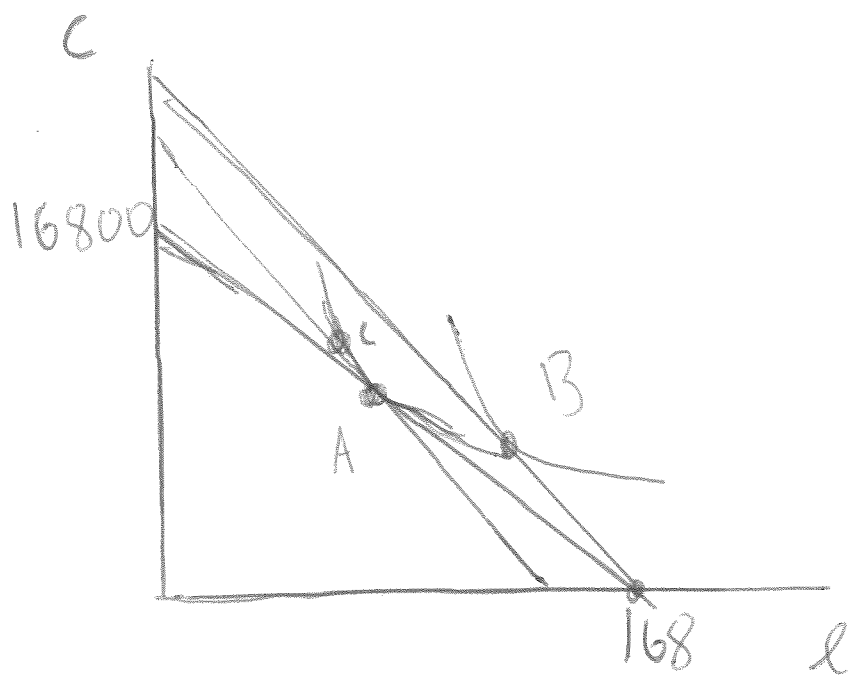


# Exercise 1

a) (1)

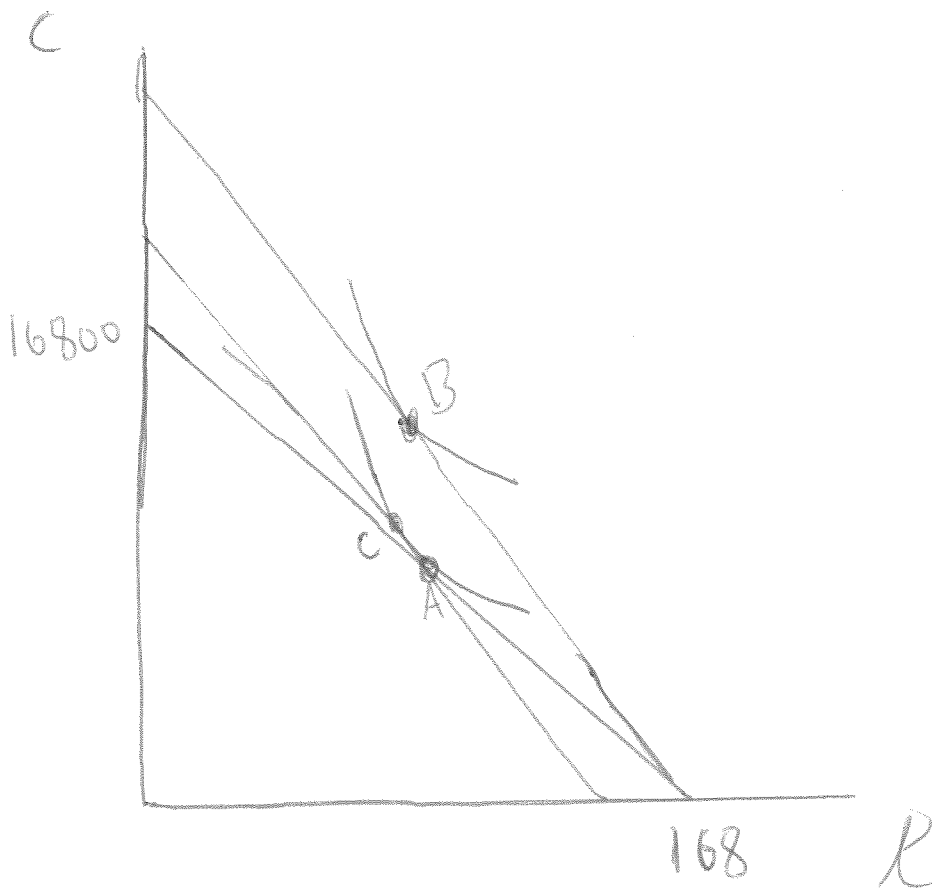


The substitution effect is the movement from A to C. The income effect is the movement from C to B.

(2)

$$\epsilon_h = \frac{\% \text{ change } h}{\% \text{ change } w} = \frac{\frac{\partial h}{h}}{\frac{\partial w}{w}} = \frac{\ominus}{\oplus} = \ominus$$

b) (1)



The substitution effect is the movement from A to C. The income effect is the movement from C to B.

$$(2) \quad \epsilon_n = \frac{\% \text{ change } h}{\% \text{ change } w} = \frac{\frac{\partial h}{h}}{\frac{\partial w}{w}} = \frac{\oplus}{\oplus} = \oplus$$

c) (1)

Yicheng's budget is:  $C = (168 - l) \cdot 50$   
substituting for consumption he solves a  
maximization problem in  $l$ :

$$\max_l \log((168 - l) \cdot 50) + \log(l)$$

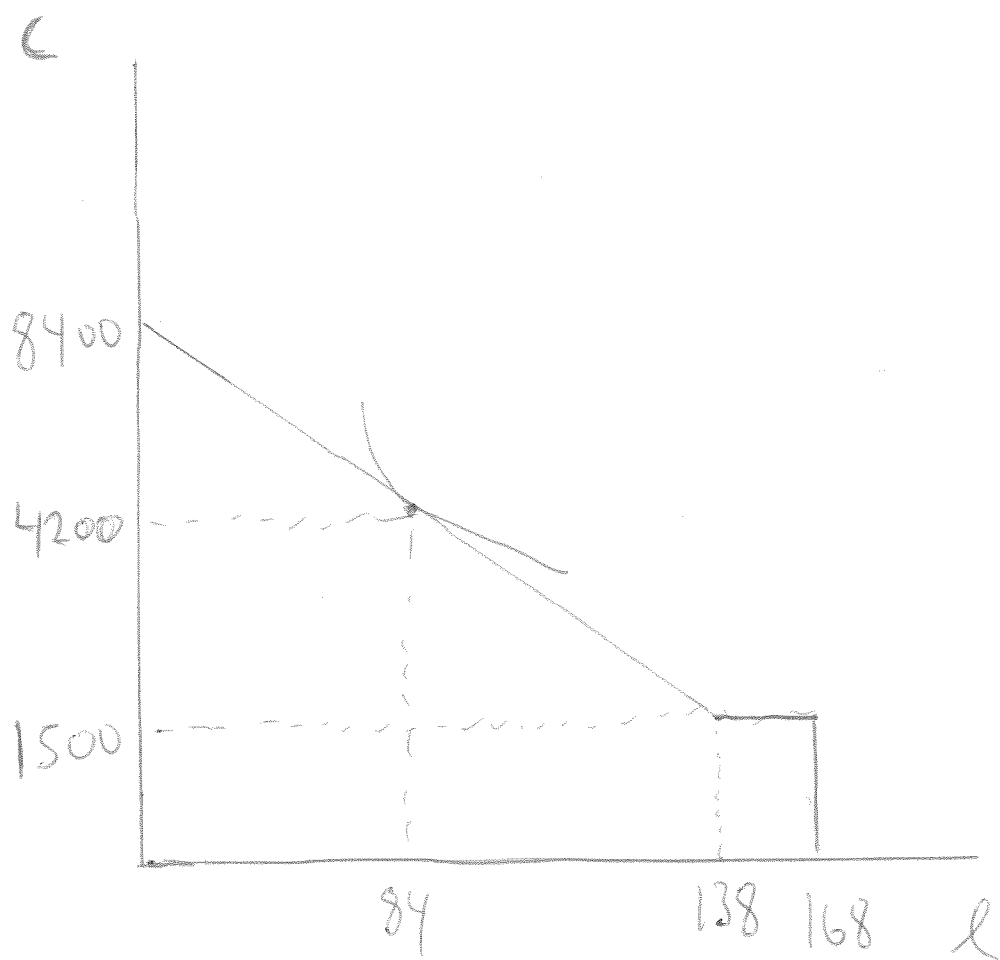
FOC:

$$\frac{-50}{(168 - l)50} + \frac{1}{l} = 0$$

$$\underline{l = 84}$$

$$C = (168 - 84) \cdot 50 = \underline{4200}$$

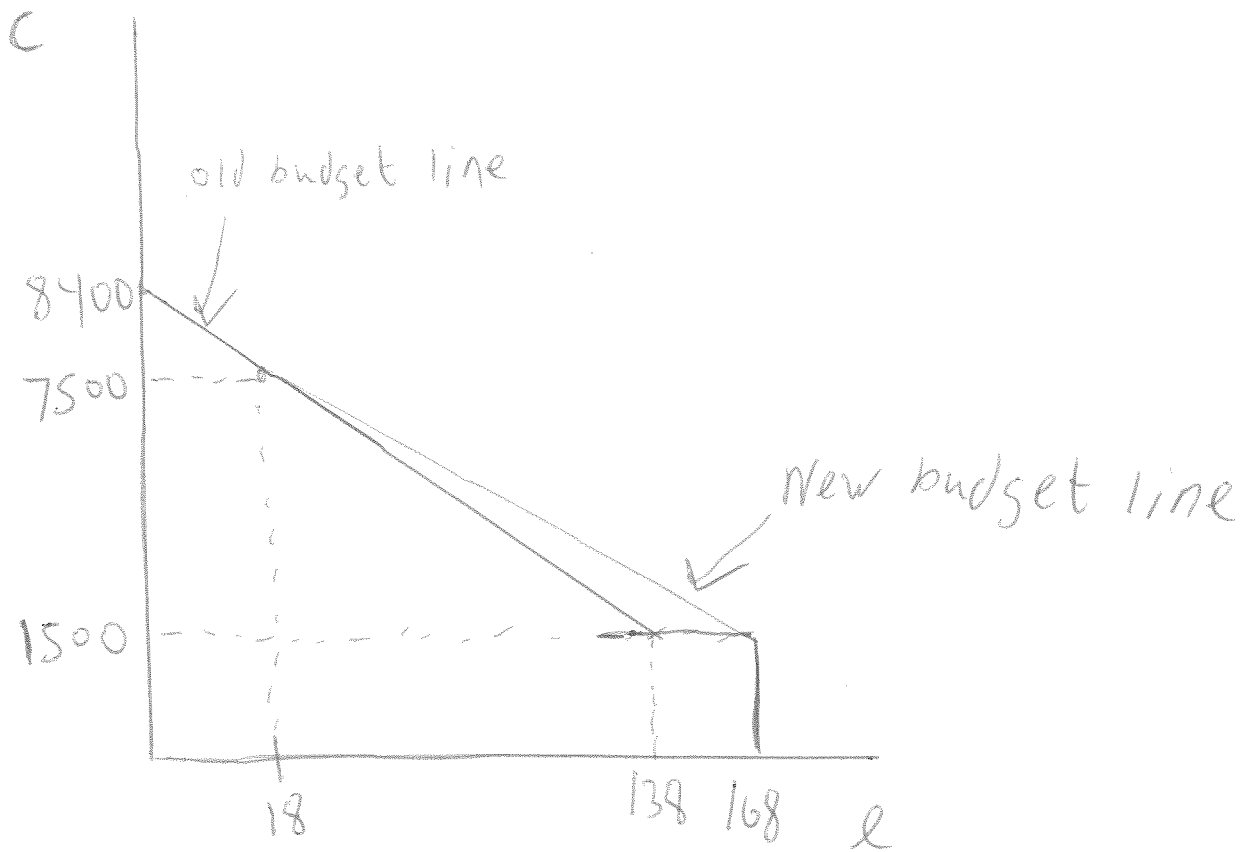
(2)



Yicheng will not work between 0 and 30 hours because this gives no increase in income. To determine whether Yicheng will be affected by the welfare program we can compare the utility at the interior solution to the utility at the corner solution.

$$\log(4200) + \log(84) = 5.547 > \log(1500) + \log(138) = 5.401$$

(3)



Now there is no range where we do not expect to see people working. Some people previously located at 0 hours ( $l=168$ ) may decide to participate in the labor force.

To find an interior solution for Yicheng note that  $C = (168 - l) \cdot 40 + 1500$  for  $l > 18$  and that he will not work between 0 and 18 hours which was an

Yicheng solves:

$$\max_l \log((168-l) \cdot 40 + 1500) + \log(l)$$

FOC:

$$\frac{-40}{-40l + 8220} + \frac{1}{l} = 0$$

$$40l = -40l + 8220$$

$$l = \underline{102.75}$$

$$C = \underline{4110}$$

Compare utility from the interior solution to the corner solution. However we ~~know~~ know the utility from the new interior solution should be higher than at the old interior solution.

d) As shown in class at the maximum we must have:

$$\frac{dc}{dl} = -\frac{u_l}{u_c} = -W$$

Thus if the slope of the indifference curve,  $\frac{dc}{dl}$ , is steeper, Marcus needs a higher wage,  $W$ .