ONE

1 $Y = ZN^{a}K^{1-a}$

$u = \ln\left(C - \frac{A}{V}\cdot(1-L)^{V}\right)$

$Y - ZN^{a}K^{1-a}$

$Z = \ln\left(C - \frac{A}{V}\cdot(1-L)^{V}\right)$

$Z = \ln\left(C - \frac{A}{V}(1-L)^{V}\right) + \lambda\left[Y - ZN^{a}K^{1-a}\right]$

$$\frac{\partial Z}{\partial L} = \frac{A(1-L)^{V-1}}{C - \frac{A}{V}(1-L)^{V}} - \lambda ZN^{a-1}K^{1-a}\,a$$

$$\frac{\partial Z}{\partial K} = \frac{1}{C - \frac{A}{V}(1-L)^{V}} - \lambda ZN^{a}K^{1-a-1}(1-a)$$

$$\frac{A(1-L)^{V-1}}{C - \frac{A}{V}(1-L)^{V}} = \frac{1}{C - \frac{A}{V}(1-L)^{V}} - \lambda ZN^{a}K^{-a}$$

$$\frac{A(1-L)^{V-1}}{C - \frac{A}{V}(1-L)^{V}} - \lambda ZN^{a}K^{-a} = \frac{1}{\cancel{C - \frac{A}{V}(1-L)^{V}}} - \lambda ZN^{a}K$$

$$\frac{K}{ZN^{a}K^{-a}(1-a)} = \frac{N}{Aa L^{a-1} K^{1-a}}$$

$$K = \frac{W(1-a)}{ra} L$$

$$L = \frac{ar}{(1-a)w} K = \frac{a}{1-a\,w} K$$

$$Y = Z \cdot N^{a} K^{1-a}$$

$$Y = Z\left(\frac{a}{1-a} \cdot \frac{r}{wK}\right)^{a} K^{1-a}$$

$$= \frac{Za^{a} r^{a}}{(1-a)^{a} w^{a} K^{a}} \cdot K^{1-a}$$

$$= \frac{Aa^{a} r^{a}}{(1-a)^{a} w^{a}} K^{a} \cdot K^{1-a} = \frac{Z \cdot a^{a} \cdot N^{a}}{(1-a)^{a} w^{a} \cdot K}$$

$$Y = \frac{Za^{a} \cancel{z}^{a}}{(1-a)^{a} w^{a}} K$$

$$K^{*} = \frac{Y \cdot (1-a)^{a} w^{a}}{Za^{a} z^{a}}$$

$$Y = ZL^{\alpha}\left(\frac{1-\alpha}{\alpha}\cdot\frac{w}{Z}N\right)^{1-\alpha} = Z\cdot N^{\alpha}\frac{(1-\alpha)^{1-\alpha}}{\alpha^{1-\alpha}}\cdot\frac{w^{1-\alpha}}{Z^{1-\alpha}}N^{1-\alpha}$$

$$= Z\frac{N(1-\alpha)^{1-\alpha}}{\alpha^{1-\alpha}}\cdot\frac{w^{1-\alpha}}{Z^{1-\alpha}}$$

$$N^{*} = \frac{Y\,\alpha^{1-\alpha}\,Z^{1-\alpha}}{Z(1-\alpha)^{1-\alpha}\cdot w^{1-\alpha}}$$

2 $Z = 1.5,\ L = 20,\ \alpha = 0.6,\ w = 1$

$$N^{*} = \frac{0.6^{1-0.6}\cdot 1.5^{1-0.6}}{1.5(1-0.6)^{1-0.6}\cdot 1^{(1-0.6)}}$$

$$= \frac{0.9587}{1.0397} = 0.9221 \text{ units}$$

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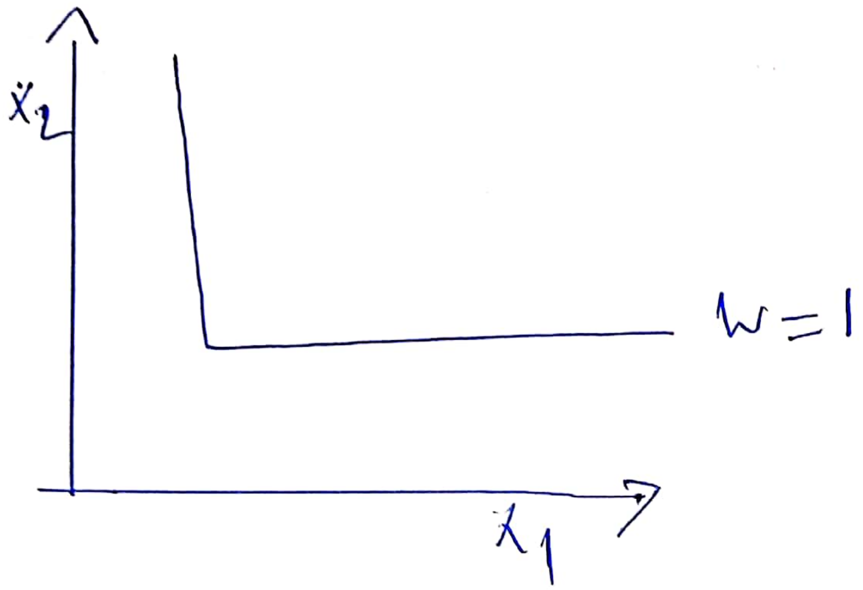
3



4 $$Y = Z\left[\frac{a}{1-a}\,\frac{Z}{w}\,K\right]^{a}\left(\frac{1-a}{a}\cdot\frac{w}{Z}\,N\right)^{1-a}$$

Exogenous variables = K

endogenous variables = N

5 A higher-wage rate increases the opportunity Cost or Price of leissure and increases Worker incomes

A wage rise. increases the quantity. of labour Supplied through the substitution effect, but reduces the quantity Supplied through the income effect.

In conclusion, as wage increases, working the same number of hours worked and maintain the Previous level. of income so labour supply NS, decreases

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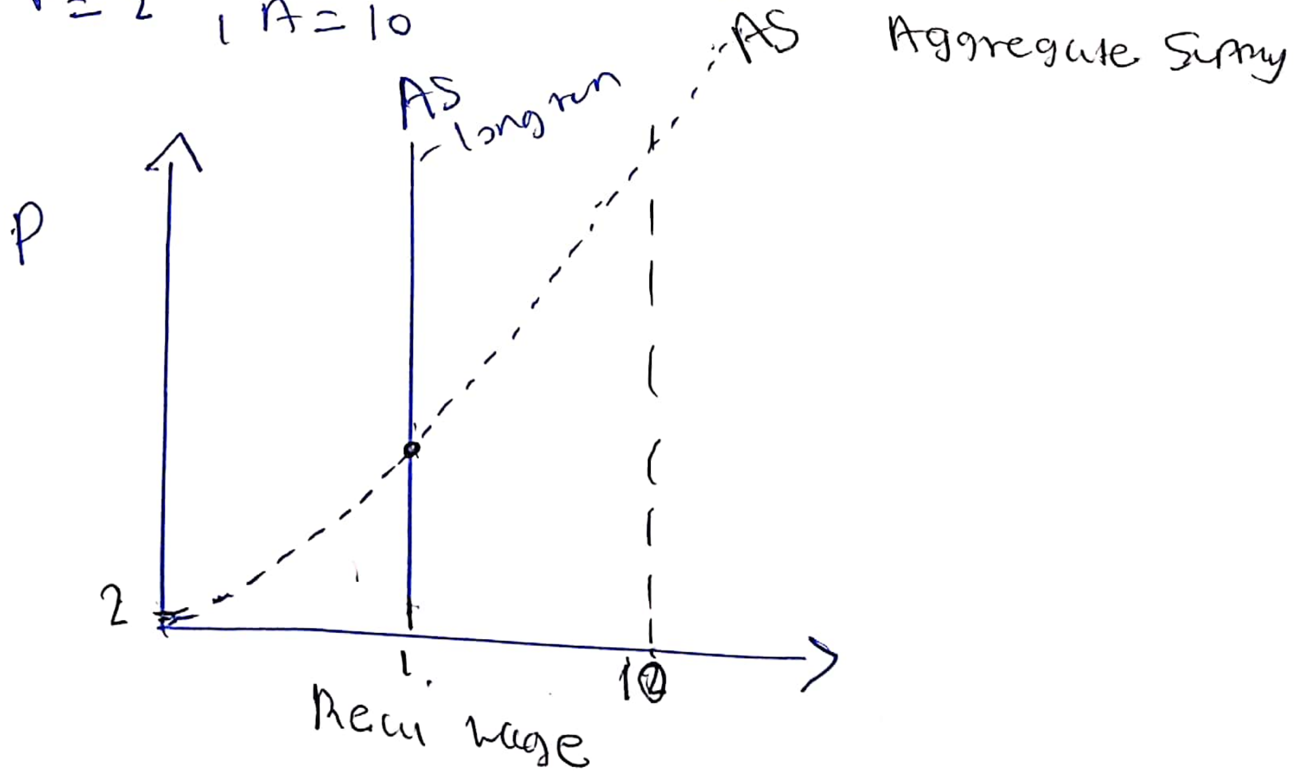
6 · N^S = Aggregate labour Supply

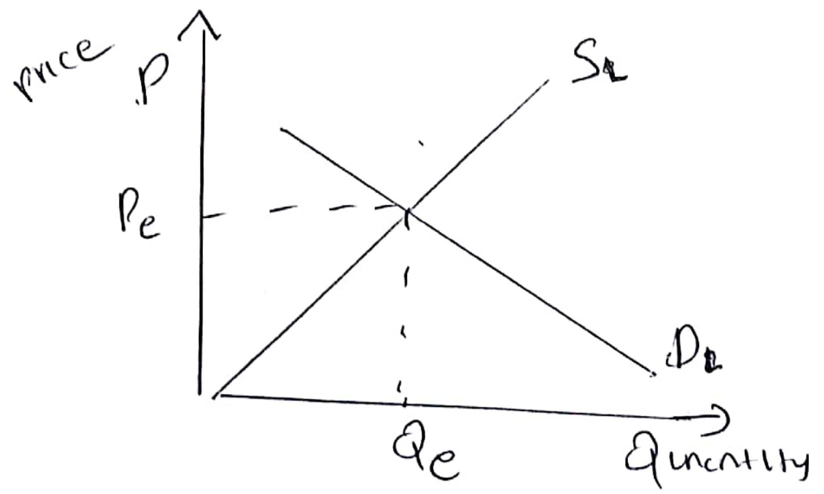
$r = 2$, $A = 10$



7 A competitive equilibrium is a condition in which profit-maximizing producers and utility-maximizing consumers in competitive markets with freely determined prices arrive at an equilibrium price.

=> At this equilibrium price, the quantity supplied is equal to the quantity demanded

Variables => quantity demanded
Quantity supplied
equilibrium price | market clearing price



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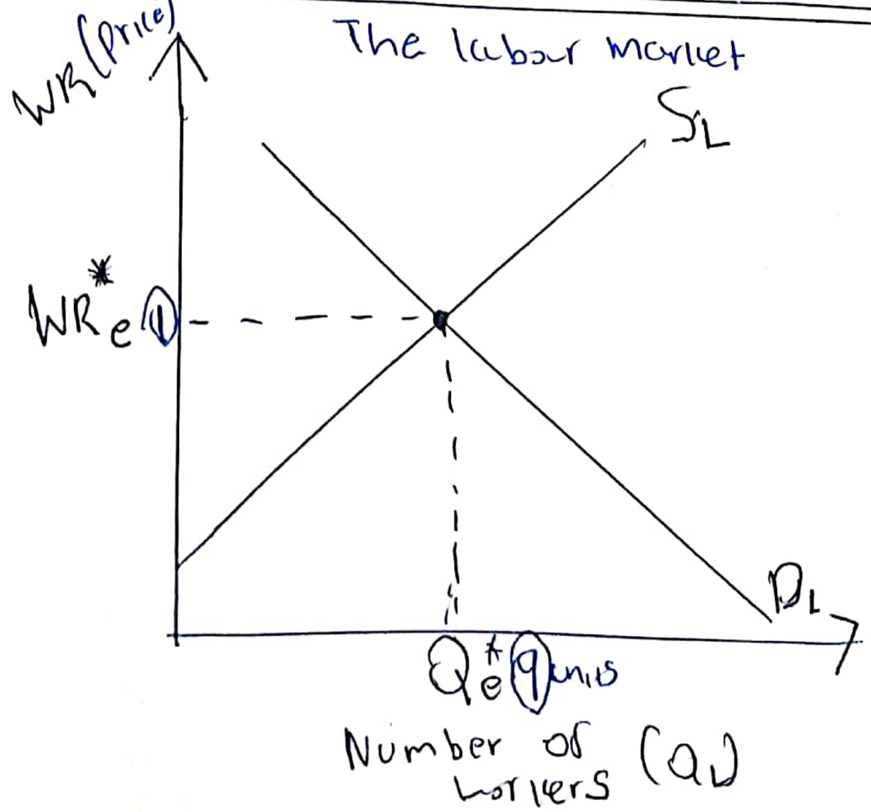

$N_d^* = 9$ units
$w = 1$

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9 $P = 10 \times (1) \times 1.5$

$= \underline{\underline{15}}$

$N^* = 9.1222$

$K^* = \dfrac{10(1-0.6)^{0.6}(1)}{1.5(0.6)^{0.6}\ 1.5^{0.6}} = \dfrac{6.9314}{1.4081}$

$= 4.922$

$P^* = 15$

$N^* = 9.22$

$K^* = 4.922$

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