

① Question 1

$$Z^f(K, n^d) = 2\sqrt{KN^d}$$

labour
at
Penguin

$$f(Z) = 16\sqrt{\frac{1}{16} \times N^d}$$

$$w=1$$

$$\pi = TR - TC$$

$$TR = p\left(16\sqrt{\frac{1}{16}N^d}\right) - N^d \times 1$$

$$\pi = p\left(16\sqrt{\frac{1}{16}N^d} - N^d\right)$$

$$\frac{\partial \pi}{\partial N^d} = p\left(\frac{1}{16}\right)^{\frac{1}{2}} (N^d)^{\frac{1}{2}} - N^d$$

$$= p\left(N^d\left(\frac{1}{2}\right) - N^d\right)$$

$$= \frac{1}{2}N^d - \frac{1}{2}p - 1 = 0$$

$$N^d = \left(\frac{1}{4}\right)$$

$$= \frac{1}{2}N^{\frac{1}{2}} - 1 = 0$$

$$N^d^{-\frac{1}{2}} = 2$$

$$2 \times \frac{1}{2}N^{\frac{1}{2}} = 1 \Rightarrow$$

$$\frac{1}{N^d^{\frac{1}{2}}} = 2$$

$$\left(\frac{1}{N^d}\right)^{\frac{1}{2}} = 2$$

$$\textcircled{1} \quad 2\pi K - \pi C$$

$$= 16 \sqrt{\frac{1}{16} \times \frac{1}{4}} - 1$$

$$= 16 \sqrt{\frac{1}{64}} - 1 \quad \text{therefore } \pi = 2$$

$$\textcircled{2} \quad V = C + 4\sqrt{L} + 2$$

$$C = \underline{n}(1-t)(h-L) + \pi$$

$$= 1(1-2)(16-L) + 2$$

$$C = 16L - L^2 - 32 + 2L$$

$$\left(L(16-L) - 2(16-L) \right)$$

C^*

$$-L^2 + 18L - 32 + 2$$

e

$$C = \boxed{-L^2 + 18L - 30}$$

$$V_{\max} = \underline{f(x)} + \lambda (\text{cost function / budget function})$$

$$V_{\max} = C + 4\sqrt{L} + 2 + \lambda (-L^2 + 18L - 30)$$

Continuation

$$\frac{dy}{dc} = 1$$

$$\frac{dy}{dL} = 2(L+2)^{-\frac{1}{2}} + 2L + 18 = 0$$

$$\frac{\partial y}{\partial L} = -L^2 + 18L - 30 = 0$$

$$L^2 + 18L = 30, \quad \text{prod} = 30$$

$$\text{sum} = 18$$

$$L^2 + 18L = -30$$

$$\begin{array}{r} 160 \\ 8 \\ \hline 8 \end{array}$$

$$-L^2 + 18L - 30 = 0$$

$$-L^2 + \left(\frac{9}{2}\right)^2 = \frac{30}{1} + \left(\frac{18}{2}\right)^2$$

$$\begin{array}{r} 81 \\ 30 \\ \hline 111 \end{array}$$

$$C = 2(h-4) - 9 \sqrt{L+9}$$

$$16(16-L) - 2 \quad -L + 9 = 10.54$$

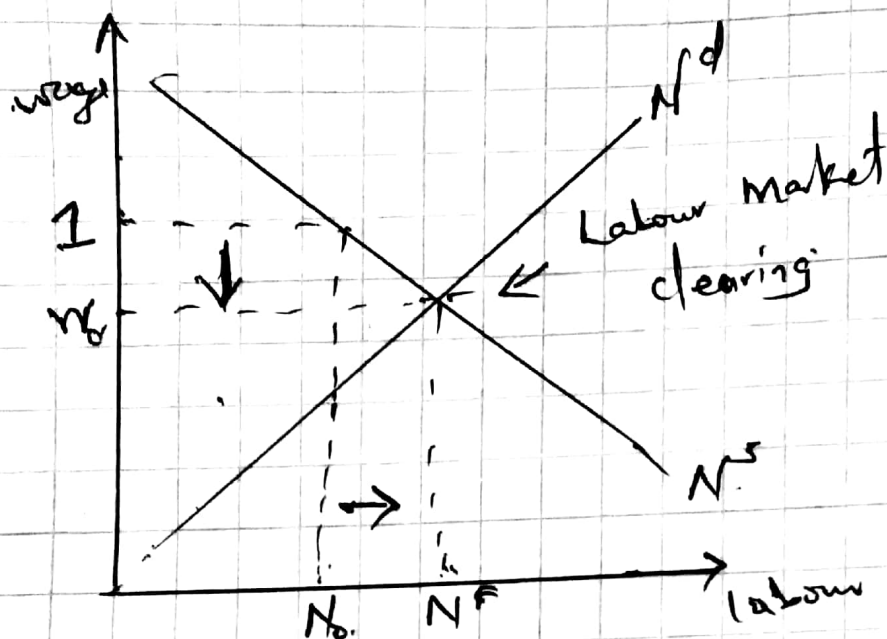
$$256 - 16L = 2 \quad -L = 10.54 \quad \neq 19.54$$

$$254 - 16L$$

$$L = 1.54$$

$$L = 19 \approx 20$$

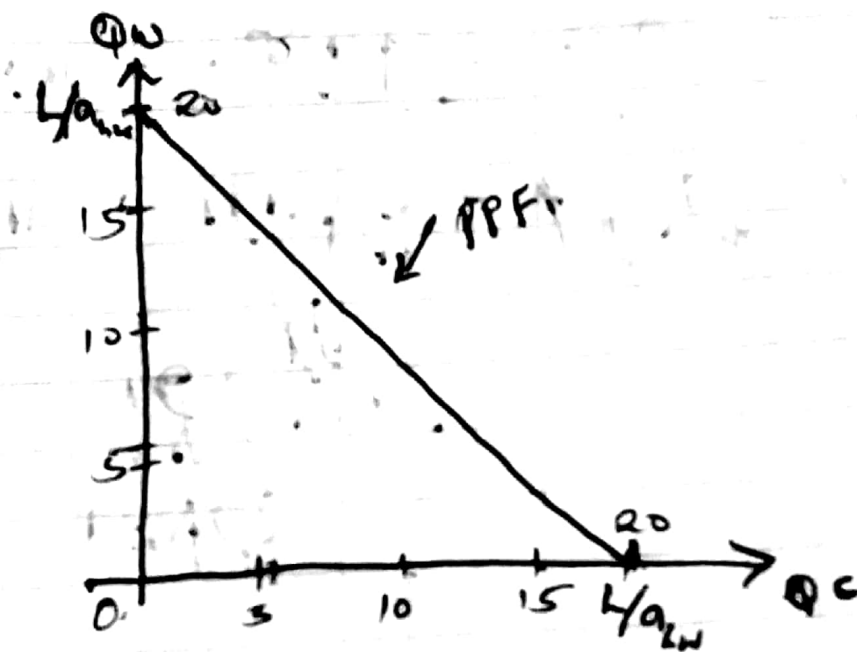
④



The labour demand and labour supply would not clear in labour market. This is because the labour demand is ^{less} smaller than the labour supply.

The required labour demand is 1 ^{while} and the labour supply is 20. The wage is too high and therefore for the labour market to clear the wage will be pushed downward.

3 Production Possibility Frontier



$$a_{LC}Q_C + a_{LW}Q_W = L$$

$$a_{LW} = 1 = w(\text{wage})$$

$$Q_C + Q_W = 20$$