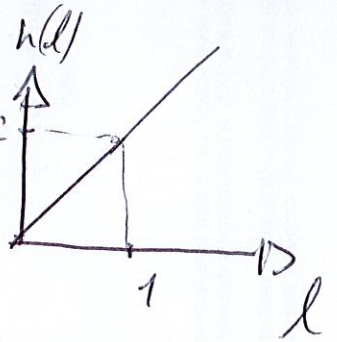
Problem 9 (PS #5)

$y = h(\ell) = c\,\ell^{1-\alpha}$ ← parameter

↑ parameter

$\alpha = 0 \Rightarrow h(\ell) = c\ell$



The max problem is:

$$\max_y \underbrace{p\cdot y - w\,\ell(y)}_{\text{Profits } \pi} = \left(p - \frac{w}{c}\right) y$$

Profits are ≥ 0 as long as $p \geq w/c$

s.t. $y = h(\ell) = c\ell \Leftrightarrow \ell(y) = y/c$

$w, p > 0$

Minimum price →

Now, Free Entry

As long as $\pi > 0$, people go into the taco business!

This is called Free entry. As more firms (taquerias) open for business, competition increases & thus profits go down!

in Eq. $\pi = 0 \Rightarrow p^* = w/c$ ← equilibrium market price from Free entry + CRS

extra condition needed when $h(\ell)$ is CRS

p^* ↑ market price

w/c Marginal Cost

$\alpha = 1/2 \Rightarrow y = h(\ell) = c\,\ell^{1/2}$ ← DRS technology $\Rightarrow \ell(y) = \left(\frac{y}{c}\right)^2$

$\Rightarrow \max_y \pi = \max_y p^* y - \frac{y^2}{c} w \xrightarrow{\text{FOC}} p^* = 2y\frac{w}{c} \Rightarrow \boxed{y^*(p) = \frac{c}{2w} p^*}$

Because Equilibrium First order condition!

$Qd(p) = a - bp = y^*(p) = \frac{c}{2w} p$ ← Supply function

Price $= MC = \frac{d}{dy}\left(\frac{w y^2}{c}\right) = 2y\frac{w}{c}$

$bp + \frac{c}{2w} p = a$

$p = \frac{a}{b + \frac{c}{2w}} = \frac{2wa}{2wb + c} = \frac{2wa}{2wb + c}$

PS #5 Problem 4 (last exercise)

1 firm = Monopoly

Because of eq.
Demand → $q = y$ ← supply

$Qd(p) = a - bp \Rightarrow p(q) = \frac{a-q}{b}$

Recall
$y = cl^{1/2}$
$\Rightarrow l(y) = \left(\frac{y}{c}\right)^2$

New problem (monopolist)

$\max_q \; p \cdot q - w\,l(q)$

$\max_q \; p(q)\,q - w\left(\frac{y}{c}\right)^2$ → First Order Conditions

$p'(q)\,q + p(q) - \frac{2w}{c}q = 0$

$p'(q)\,q + p(q) = \frac{2w}{c}q$

Marginal revenue | Marginal Cost