Monopoly

- Competitive Markets
  - Many firms
  - "price takers"
  - Free entry/exit
  - Zero long-run π
- Monopoly
  - Single firm
  - "Price makers"
    The firm can choose p
  - Barriers to entry
  - Positive long-run profits

Inverse demand

Demand curves: (function)
  input: price
  output: quantity
Inverse demand:
  input: quantity
  output: maximum willingness to pay for a given quantity
Demand function: $D(p) = y$
Inverse demand: $p = D^{-1}(y)$

Example

$$D(p) = 10 - 3p$$

$$y = 10 - 3p$$

To find inverse demand, simply solve for p

$$3p + y = 10$$

$$3p = 10 - y$$

$$p = \frac{10 - y}{3}$$

$$p = \frac{10}{3} - \frac{y}{3}$$

$$p(y) = \frac{10}{3} - \frac{y}{3}$$

Monopoly profits

- Recall competitive π:

$$\pi_c = p \cdot y - c(y)$$

- Monopolists:

$$\pi_m = P(y) \cdot y - c(y)$$

π-max:

$$MR = MC$$

$$MC = \frac{d\,c(y)}{dy} \quad \left(\text{just like in comp.}\right)$$

$$MR = \frac{d\left(P(y) \cdot y\right)}{dy}$$

$$MR = \frac{dP(y)}{dy} \cdot y + P(y)$$

"chain rule"

"DON'T MEMORIZE THIS"

Example

$$P(y) = \frac{10}{3} - \frac{y}{3}$$

$$R(y) = P(y) \cdot y$$

$$= \left(\frac{10}{3} - \frac{y}{3}\right) y$$

$$= \frac{10}{3} y - \frac{y^2}{3}$$

$$MR = \frac{10}{3} - \frac{2}{3} y$$

Suppose $C(y) = y^2$

$$MR = MC$$

$$\frac{10}{3} - \frac{2}{3} y = 2y$$

$$\frac{10}{\cancel{3}} = \frac{8}{\cancel{3}} y$$

$$10 = 8y$$

$$y^* = \frac{5}{4}$$

$$P = \frac{10}{3} - \left(\frac{5}{4}\right)\frac{1}{3}$$

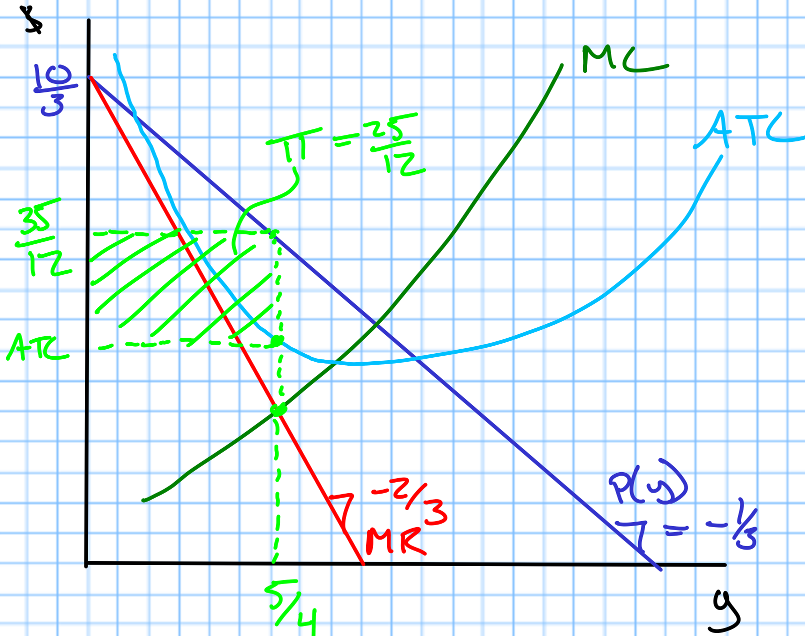
$$= \frac{40}{12} - \frac{5}{12}$$

$$= \frac{35}{12}$$

$$\pi = \frac{35}{12} \cdot \frac{5}{4} - \left(\frac{5}{4}\right)^2$$

$$= \frac{175}{48} - \frac{25}{16}$$

$$\frac{175}{48} - \frac{75}{48} = \frac{100}{48} = \frac{25}{12}$$



Natural Monopoly