

Monopoly $\pi = p(y) \cdot y - C(y)$

$p(y)$ inverse demand

y^* $\max \pi = R(y) - C(y)$

1st ord. cond: $MR(y^*) = MC(y^*)$

$R = p(y) \cdot y$ $MC = MR = p(y) + \frac{\partial p}{\partial y} \cdot y$ $\frac{\partial p}{\partial y} < 0$

$MR = p(y) \left[1 + \frac{\partial p}{\partial y} \cdot \frac{y}{p} \right]$ $\epsilon = \frac{\partial y}{\partial p} \cdot \frac{p}{y} \quad | \epsilon(y^*) | \geq 1$

$MR = p(y) \left[1 + 1/\epsilon \right]$ $MR = p(y) \left[1 - 1/|\epsilon| \right] = MC \geq 0$

$$p(y) = a - by \quad \frac{\partial p}{\partial y} = -b \quad MC(y) = 0$$

$$R = p(y) \cdot y = ay - by^2 \quad MR = a - 2by$$

$$\max_y \pi : a - 2by = 0$$

$$y^* = \frac{a}{2b}$$

$$R^* = \pi^* =$$

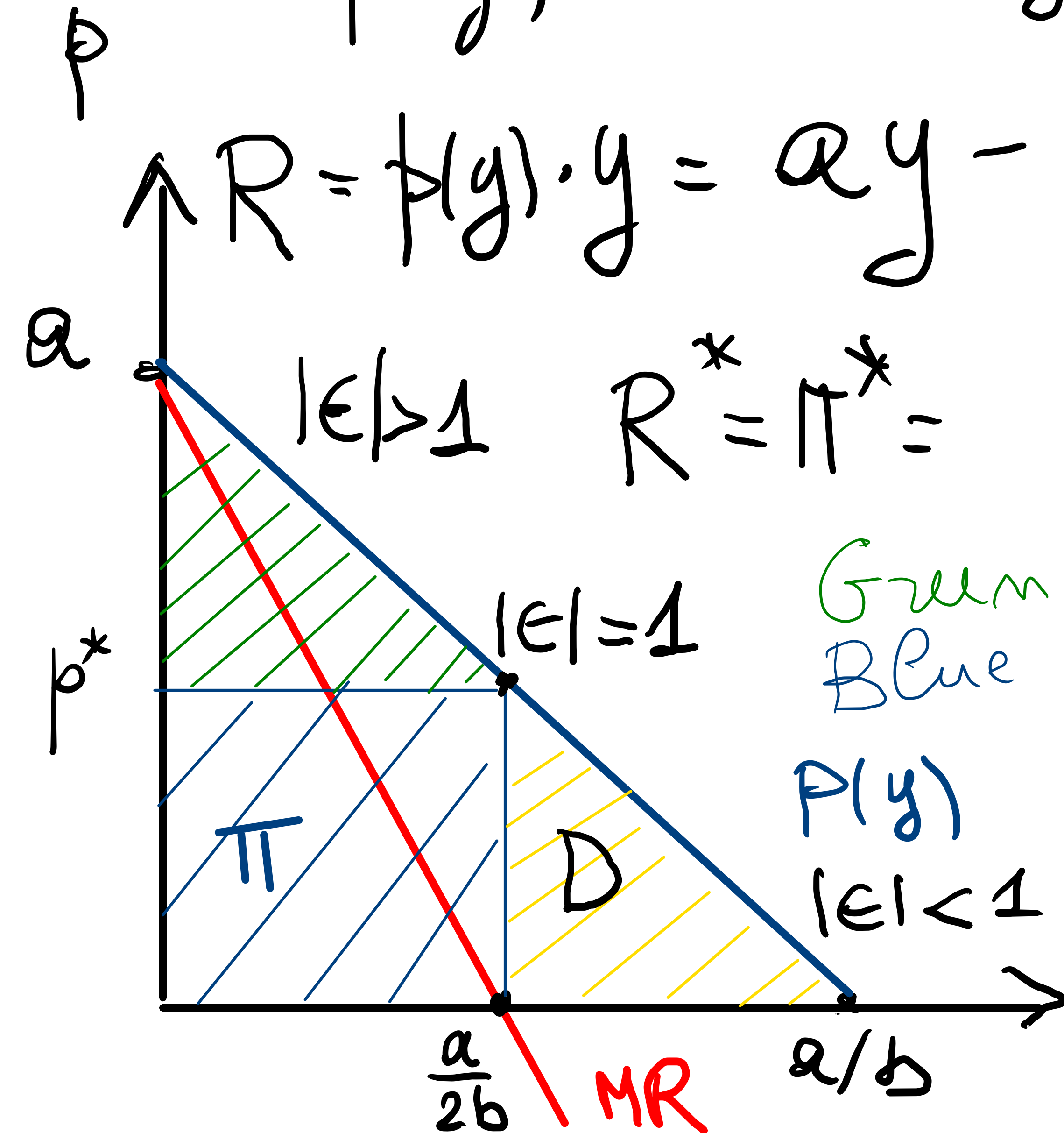
Green Area = Net Cons. Surplus

Blue Area = Net Produc. Surplus

Blue + Green = Total Net Surp.

Yellow Area = Total Net Surp. ~~under~~ ~~if~~ ~~under monopoly~~

OUTPUT y is such that
price = marginal cost



D = MONOPOLY DEAD-WEIGHT LOSS = LOSS OF TOTAL NET SURPLUS CAUSED BY THE FACT THAT THE MONOPOLIST IS FIXING PRICE p^* AND OUTPUT y^* such that p^* IS HIGHER THEN THE MARGINAL COST OF PRODUCING y^* .

MONOPOLY OUTPUT $y^* <$ output at which price = marginal cost

D = (Total net Surplus if one firm is producing y such that price = marginal cost) - (Total net Surplus under monopoly)

$$C(y) = cy^2$$

$$MC = 2cy$$

AREA S = CONSUMERS' NET SURPLUS

BLUE AREA = MONOPOLY PROFIT = PRODUCER'S NET SURPLUS

$$MC(y)$$

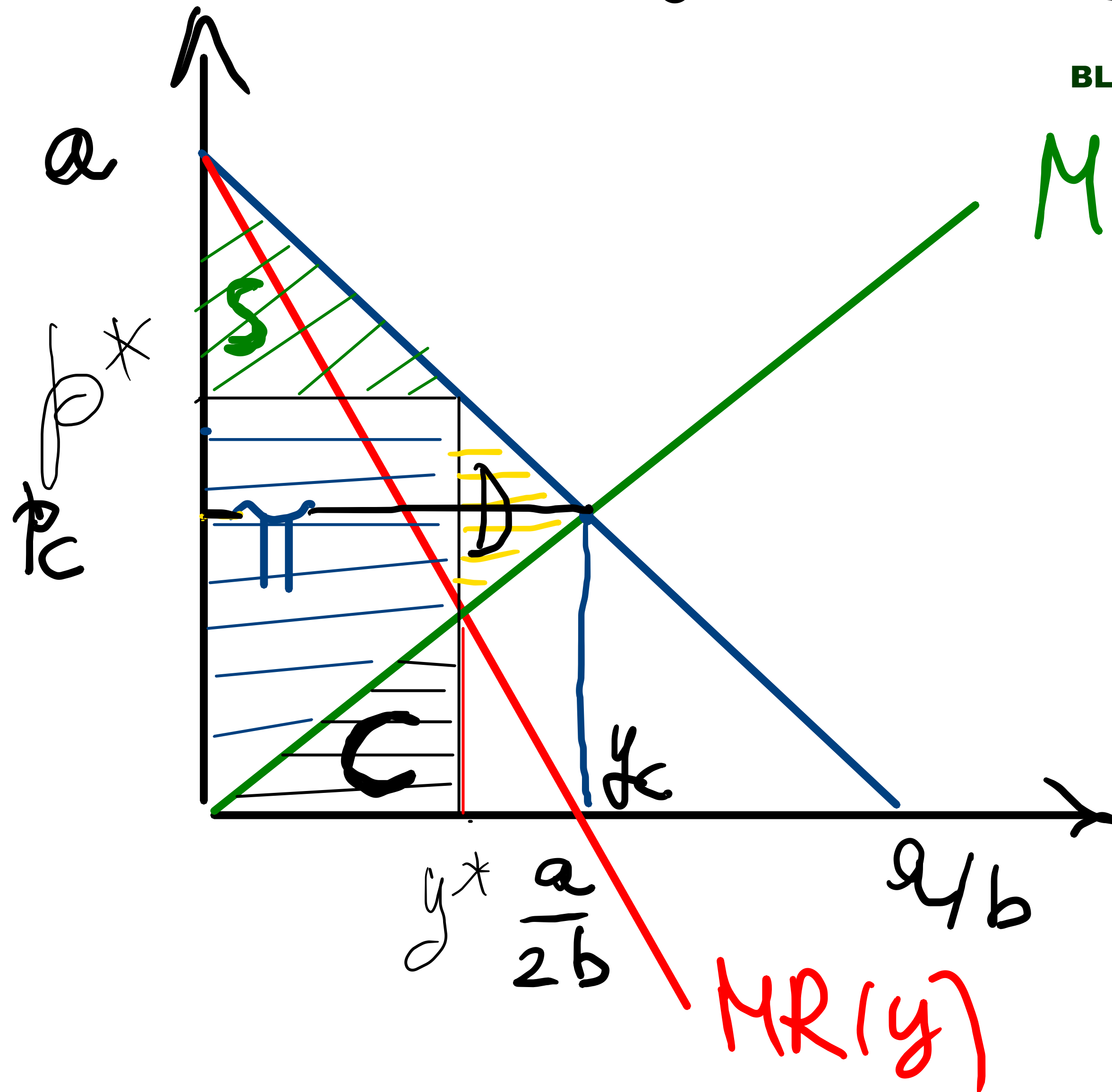
Area C = TOT Cost
for producing y^*

$$\pi^* = p^* y^* - C(y)$$

$p_c y_c = \text{exp. under comp}$

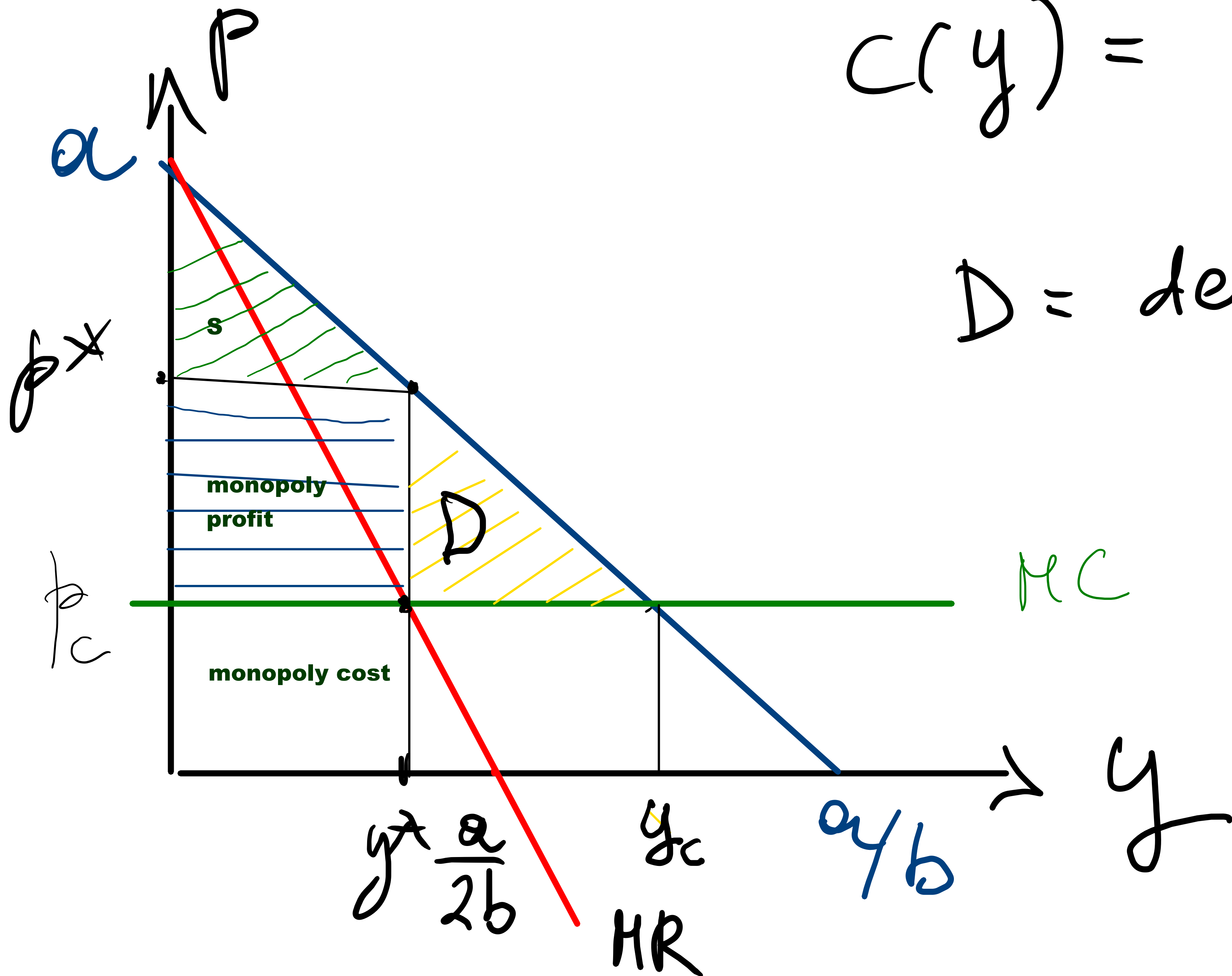
y

Area D = Monopoly
Dead-weight loss



$$C(y) = cy \quad MC = c$$

$D = \text{dead-weight loss}$



p

$P(y)$

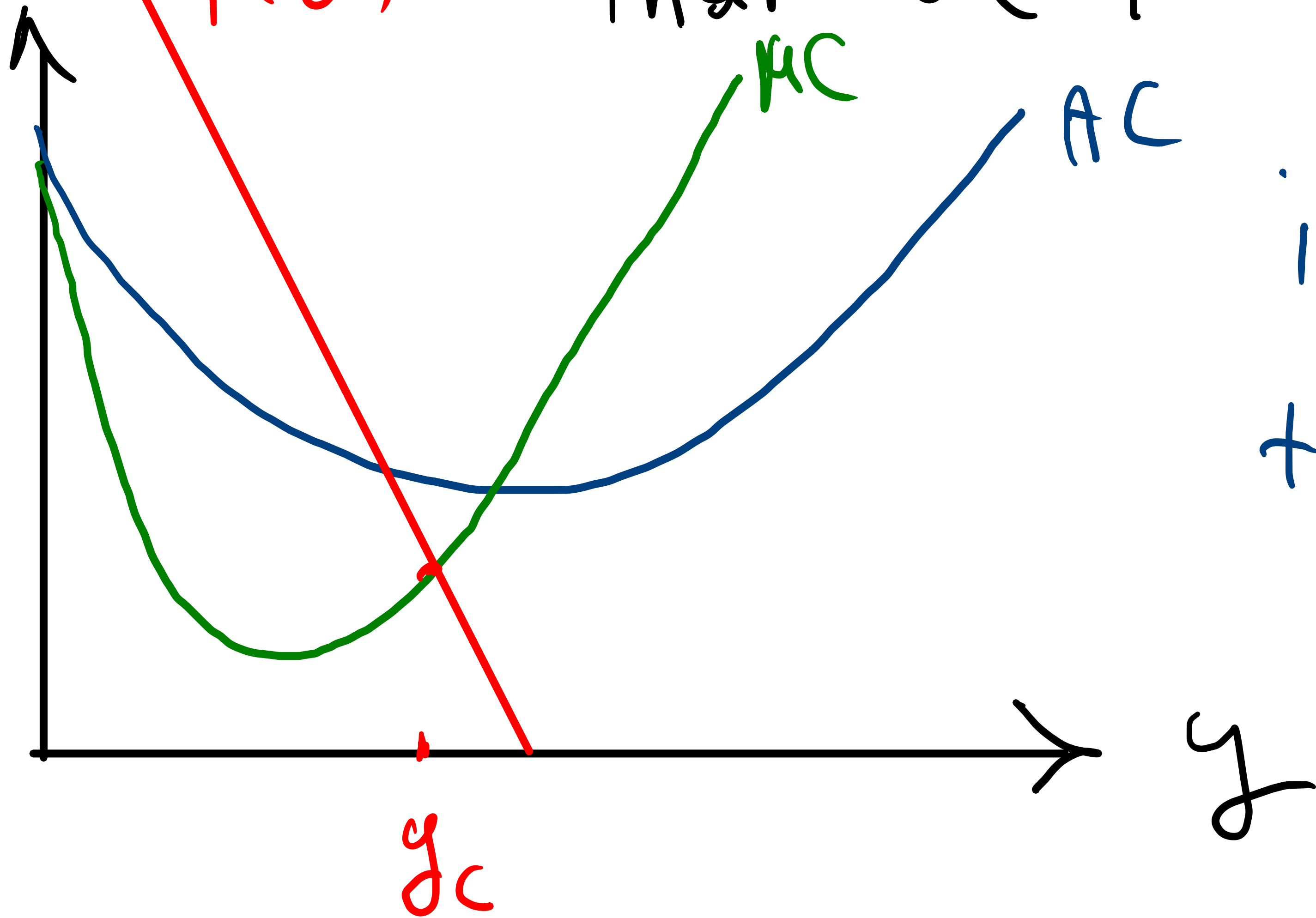
Natural Monopoly

MC

AC

if $p = MC$

then $p < AC$



Oligopoly

duopoly

$n=2$

identical firms

Simultaneous
game

Cournot duopoly
firms decide on q_i

Bertrand duopoly
decisions on p_i

leader
follower

Sequential moves game

Stackelberg

on quantity

on prices

$n > 2$

barriers to entry
 n is fixed
product is
homog.