Monopoly

- Monopoly and perfect competition.
- Profit maximization by a monopolist.
- Inefficiency of a monopoly.
- Why do monopolies occur?
- Natural Monopolies.

Monopoly and Perfect Competition

- **Perfect competition**: each firm takes market price as given and decides how much to produce.

- **Monopoly**: does not take market price as given when deciding quantity. Figures that higher production will lead to different price.

Monopoly and Perfect Competition: Demand Curves

Profit Maximization

Monopolist maximizes profits:

$$\max_{y} r(y) - c(y)$$

Profit Maximization: Revenue

Competitive firm: $r(y) = p^* \times y$

Monopolist: $r(y) = p_D(y) \times y$

Profit Maximization

- Solve: $\max_{y} r(y) - c(y)$

- Optimality condition:

$$MR(y) = \frac{\partial r(y)}{\partial y} = \frac{\partial c(y)}{\partial y} = MC(y)$$

Profit Maximization

- Optimality condition:

$$\frac{\partial r(y)}{\partial y} = \frac{\partial c(y)}{\partial y}$$

- Marginal revenue:

$$\frac{\partial r(y)}{\partial y} = \frac{\partial [p_D(y)y]}{\partial y} = p_D(y) + \frac{\partial p_D(y)}{\partial y} y$$

Profit Maximization

- Competitive firm:

$$p_D = MC(y)$$

- Monopolist:

$$p_D(y) + \frac{\partial p_D(y)}{\partial y} y = MC(y)$$

Profit Maximization: Example

- Inverse market demand:

$$p_D(y) = 1{,}000 - 4y$$

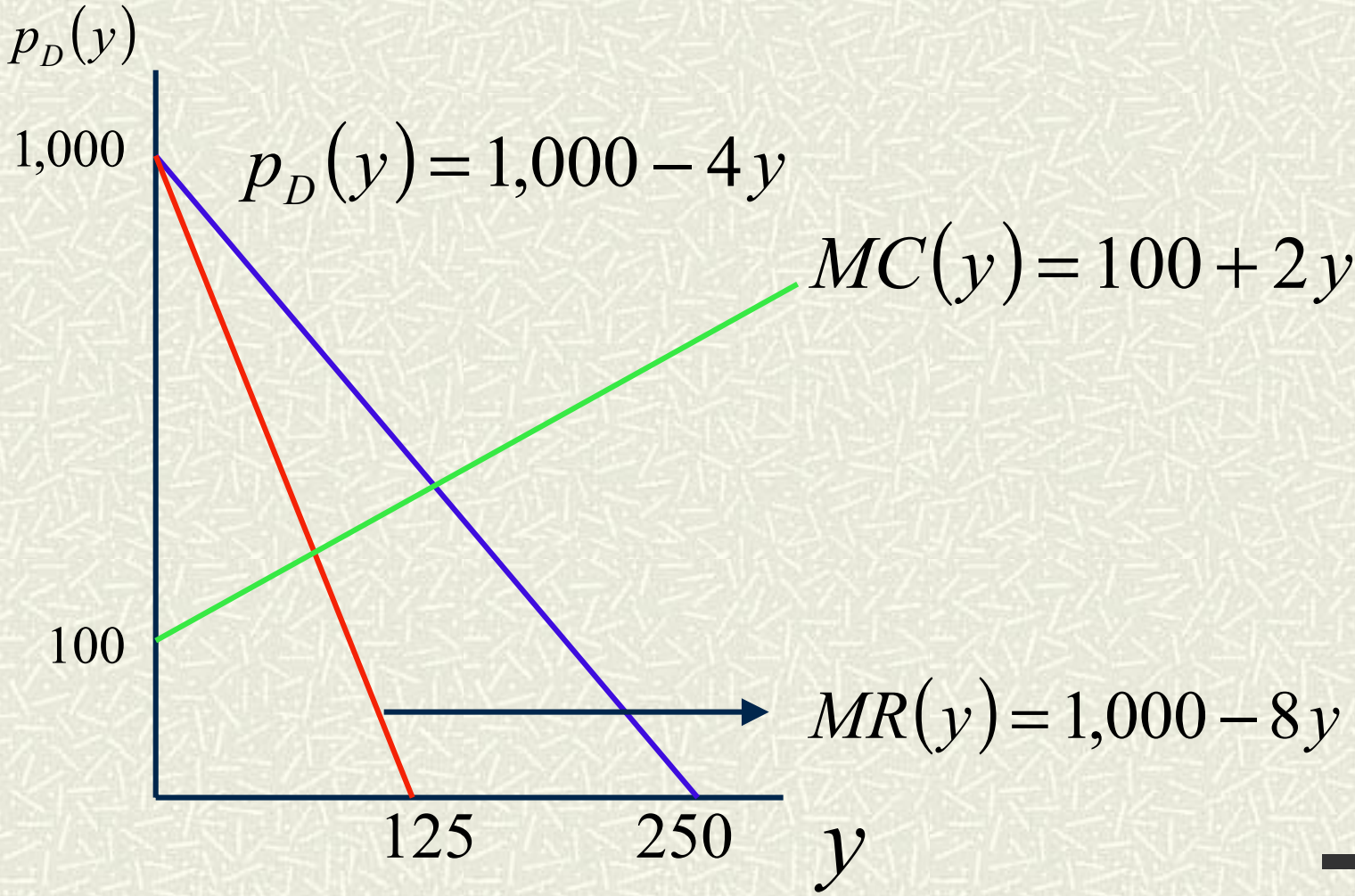
- Marginal revenue:

$$MR(y) = (1{,}000 - 4y) + \frac{\partial(1{,}000 - 4y)}{\partial y} y$$

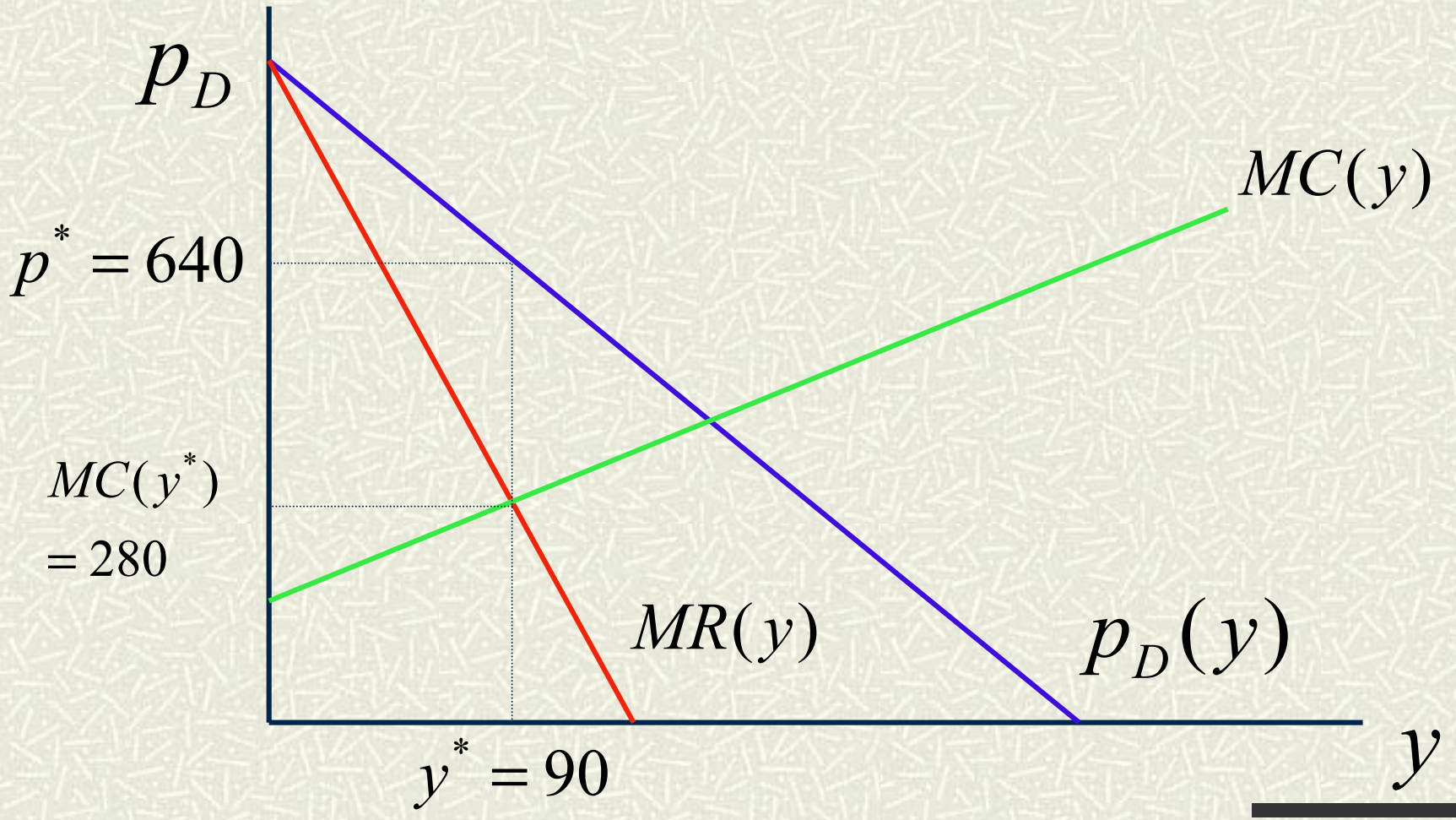
$$= (1{,}000 - 4y) - 4y$$

$$= 1{,}000 - 8y$$

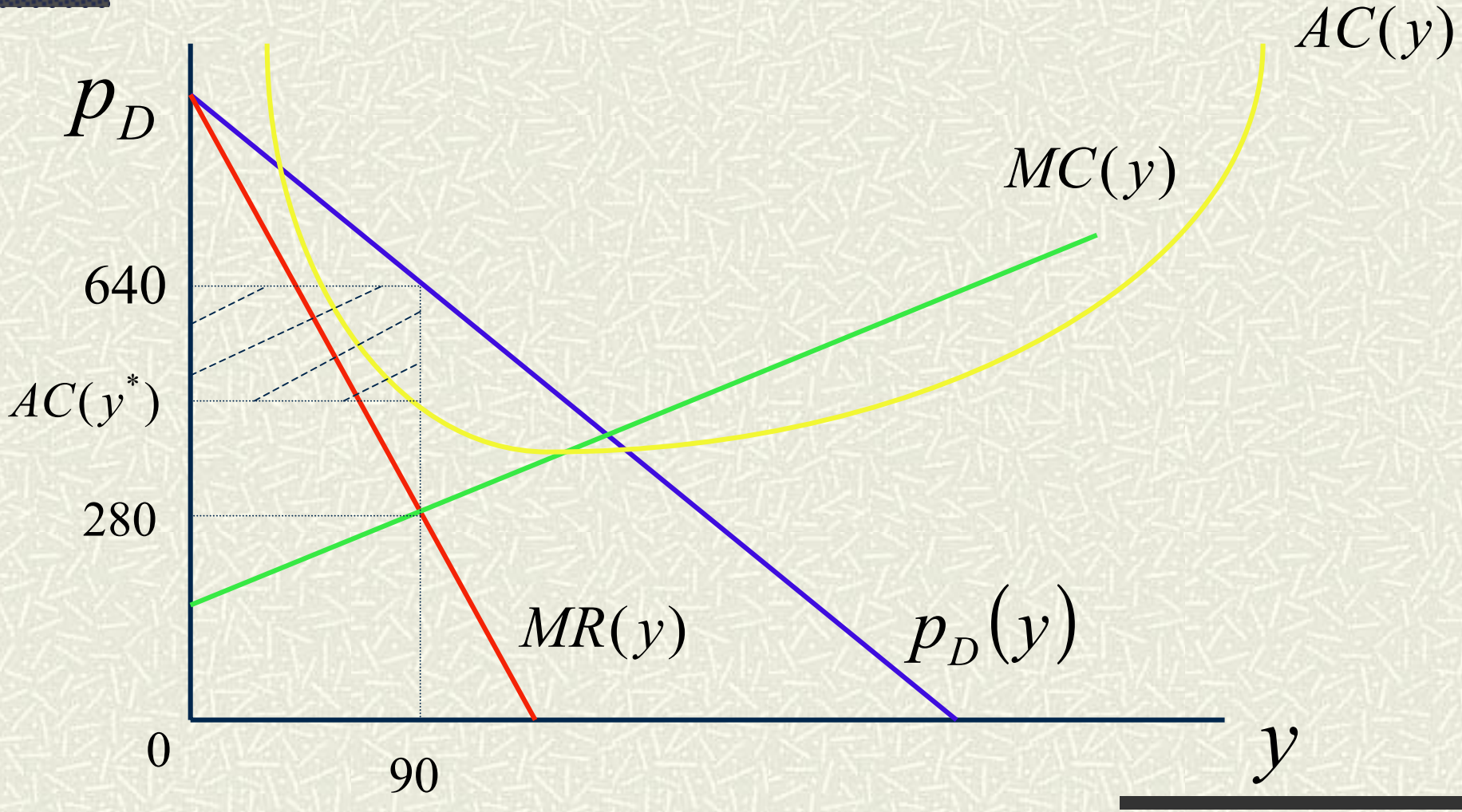
Profit Maximization: Example



Profit Maximization: Example



Profit Maximization: Example



Profit Maximization: Markup Pricing

- Price exceeds marginal cost:

$$p_D(y) + \frac{\partial p_D(y)}{\partial y} y = MC(y)$$

$-$

- Rearrange:

$$p_D(y)\left[1 + \frac{\partial p_D(y)}{\partial y}\frac{y}{p_D(y)}\right] = MC(y)$$

$\frac{1}{\varepsilon}$

Profit Maximization: Markup Pricing

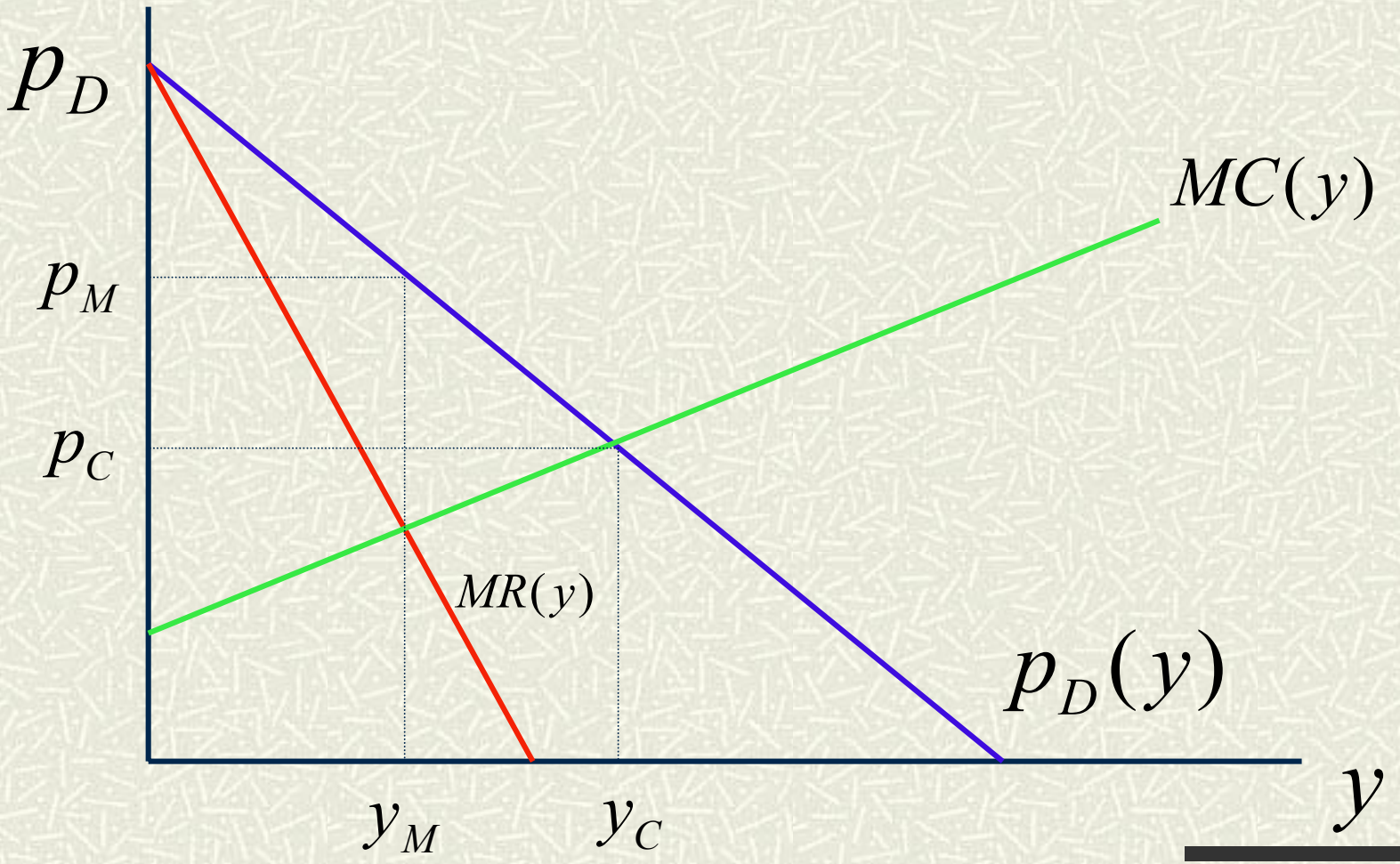
- Markup pricing:

$$p_D(y)\left[1+\frac{1}{\varepsilon}\right]=MC(y)$$

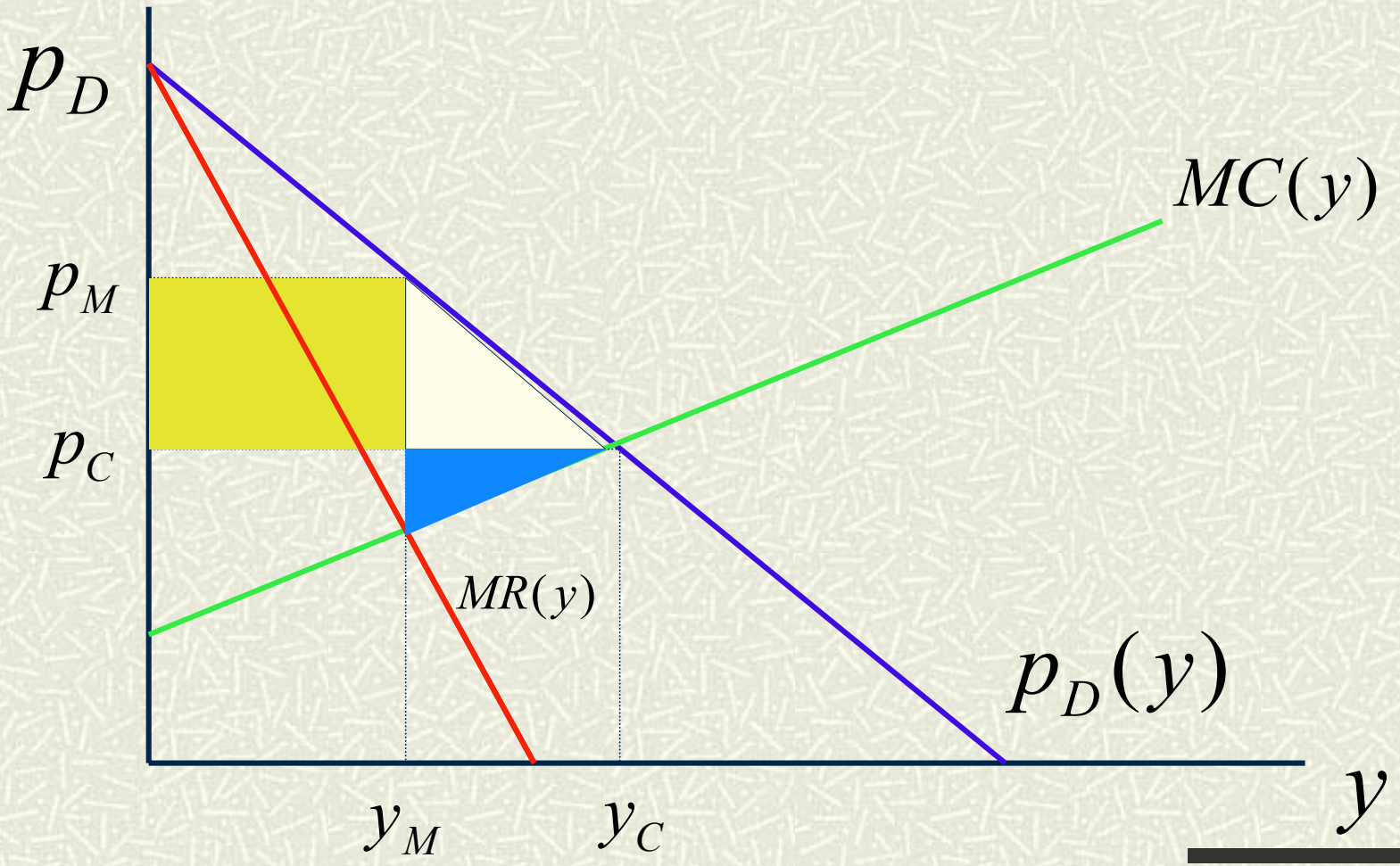
- Price/marginal cost = markup:

$$\frac{p_D(y)}{MC(y)}=\frac{1}{1+\frac{1}{\varepsilon}}>1$$

Inefficiency of a Monopoly



Inefficiency of a Monopoly: Deadweight Loss



Inefficiency of a Monopoly: What about Inventions?

- Patents in the US grant monopoly to a company over an innovative product or process for 17 years.
- Company will sell the product for 17 years at monopoly prices: deadweight loss.

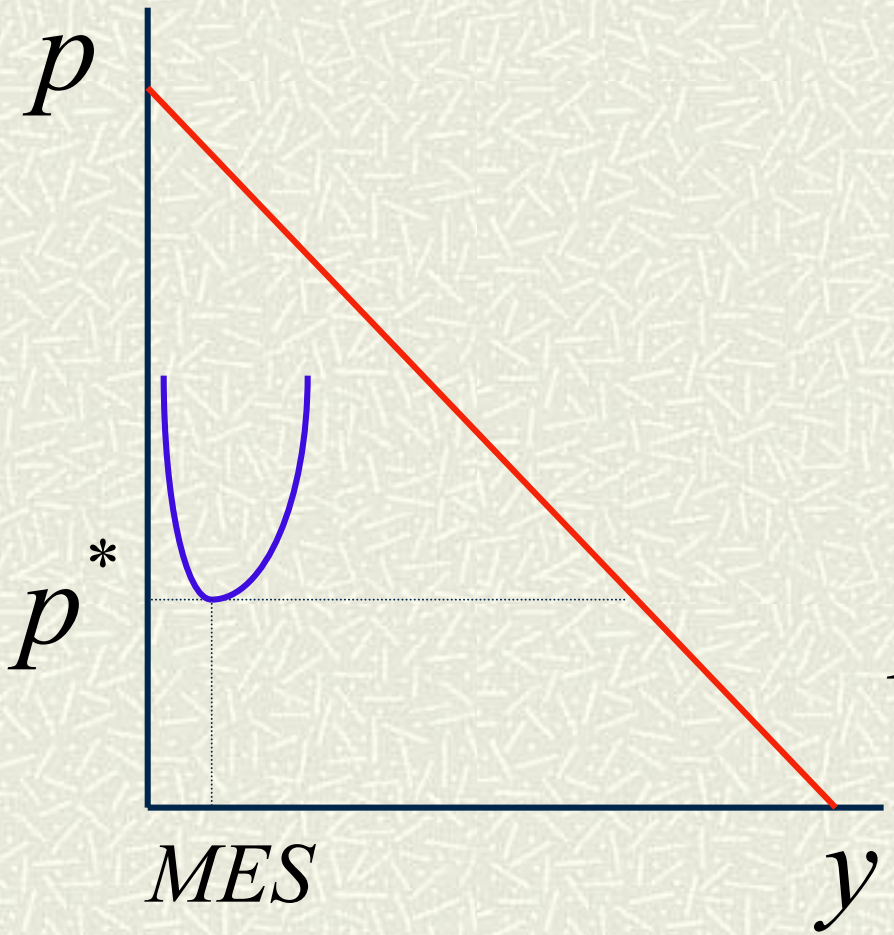
Inefficiency of a Monopoly: What about Inventions?

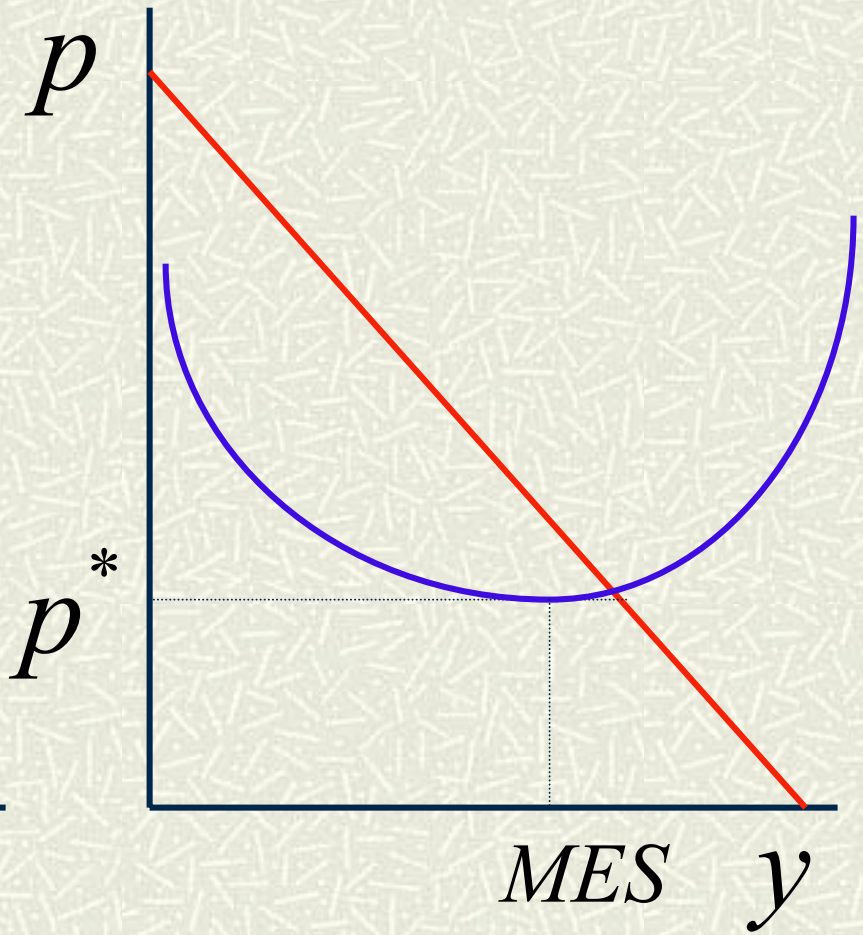
- No patent protection → little incentive to innovate.
- Too strong patent protection →
  1) Deadweight loss for longer time
  2) Low incentives to innovate
- Optimal patent life balances these conflicting effects.

Why Do Monopolies Occur?

1. Cartels.
2. Patents.
3. Incumbent's strategy of threatening potential entrants in industry to engage in a price war.
4. Relationship between the Minimum Efficient Scale and the Demand Curve.

Minimum Efficient Scale and Demand





Antitrust Laws

Sherman Act of 1890:

- Section 1: prohibits contracts and conspiracies, explicit or implicit, to restraint trade by fixing prices or restrict output.
- Section 2: illegal to monopolize or attempt to monopolize a market.

Antitrust Laws

Clayton Act of 1914:

- Illegal for a firm with a large market share to require a buyer not to buy from a competitor.
- Prohibits mergers and acquisitions if they substantially lessen competition.
- Illegal to sell a product at different prices to different buyers, if this injures competition.

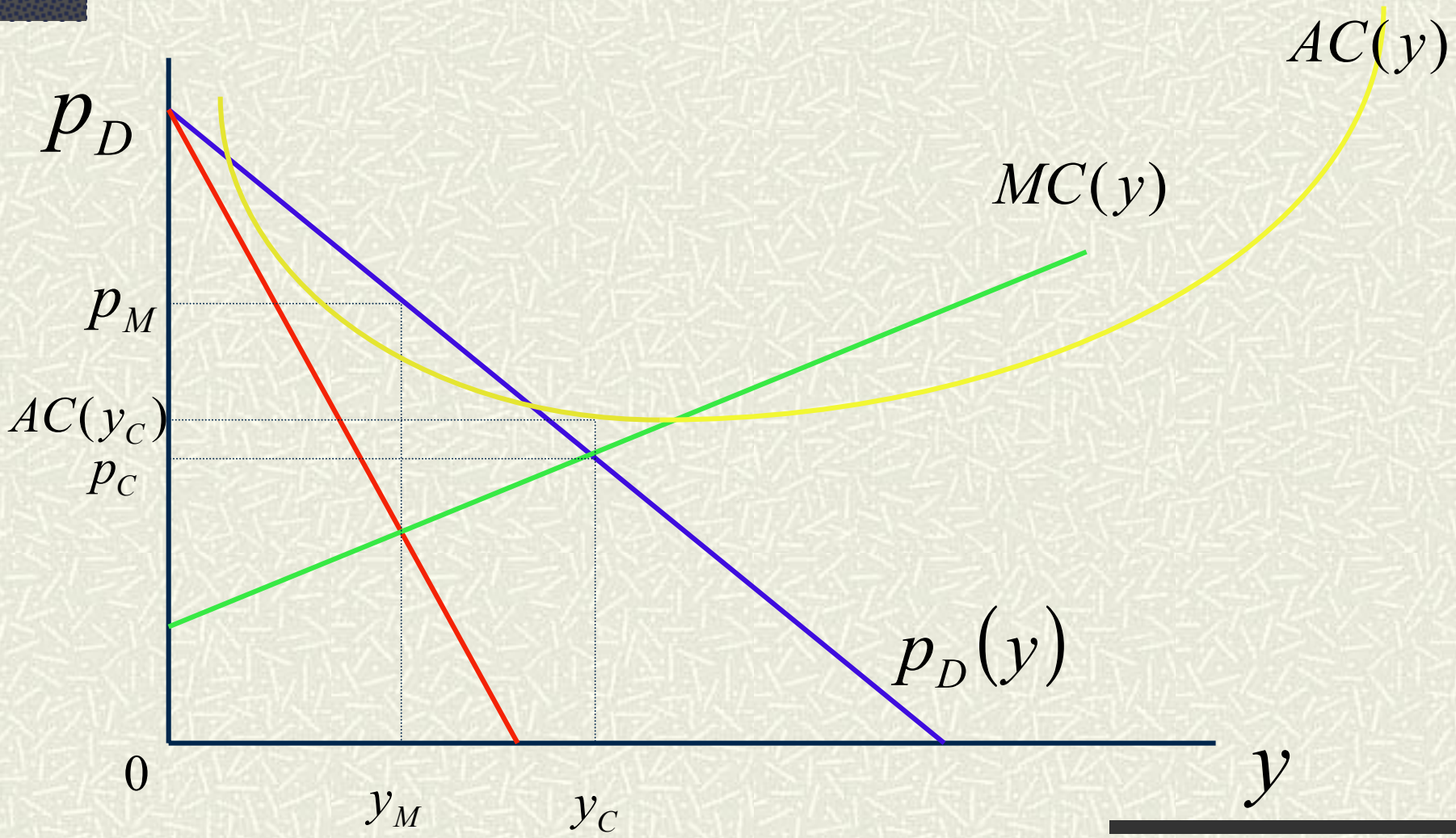
Regulation: Natural Monopoly

- Some monopolies can be regulated: government sets price equal to marginal cost.
- Problems with this policy:

  1) incentives to invest in research and innovation decrease.

  2) At that price monopoly could be making negative profits!

Regulation: Natural Monopoly



Regulating Natural Monopolies

- Examples: phone companies, gas companies, public utilities in general.
- Regulations:

1. Let monopolist charge price equal to average cost. What is a firm's cost function?
2. Government operates service: price equal marginal cost and subsidy to the firm to cover losses.