

Economics 3250  
Fall 2003

Dr. Lozada  
Exam 2

**Do Not Turn This Page Over Until You Are So Instructed!**

This exam has 25 points. There are six questions on the exam. Question 1 is worth 5 points; the other questions are worth 4 points each. Put your answers to the exam in a blue book or on blank sheets of paper.

Answer the questions using as much precision and detail as the time allows. Correct answers which are unsupported by explanations will not be awarded points.

Answer all of the following six questions.

1. [5 points] In Figure 1, suppose  $BE = EG$ . Will a tax or a standard minimize abatement costs if Society wants the total abatement to be  $2S_2$ ? (Do explain how the firms behave under a tax or a standard, and explain why they behave that way.)
2. [4 points] Define
  - (a) technology-based standards;
  - (b) ambient-based standards; and
  - (c) benefits-based standards.Rank these from the most economically efficient to the least economically efficient and explain why you have ranked them as you have.
3. [4 points] Refer to Figure 2.
  - (a) Label the two parts of the graph which have “?” next to them. Explain briefly.
  - (b) Where is the open-access equilibrium in Fig. 2? Why?
  - (c) Where is the profit-maximizing equilibrium in Fig. 2? Why?
  - (d) Where is the maximum-sustainable-yield equilibrium in Fig. 2? Why?
4. [4 points] Refer to Figure 3. Why will an exhaustible resource firm not, at least in Hotelling’s theory, produce at  $(P^*, Q^*)$ ?
5. [4 points] In class we discussed six ways industry might benefit from being pro-environment. Name and explain three of those ways.
6. [4 points] Define the following terms in a way that clearly shows their differences:
  - (a) materials levy
  - (b) product charge
  - (c) waste disposal charge

Fig. 1

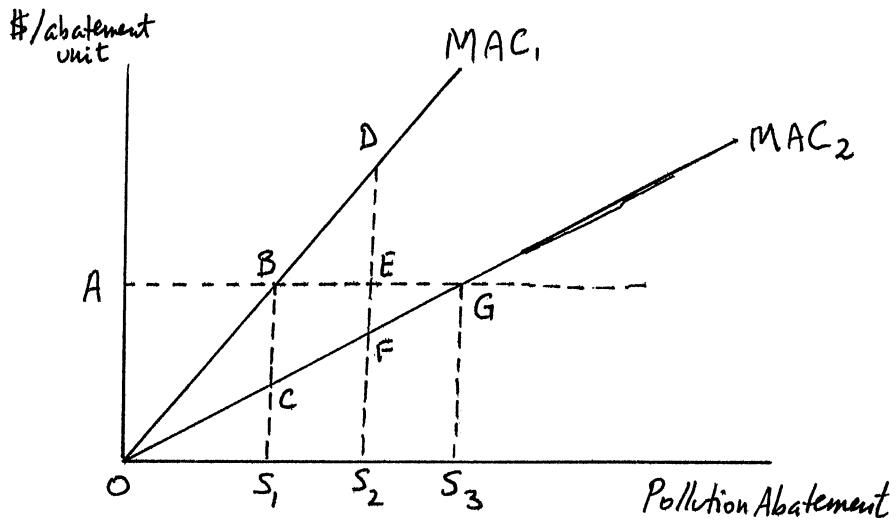


Fig. 2

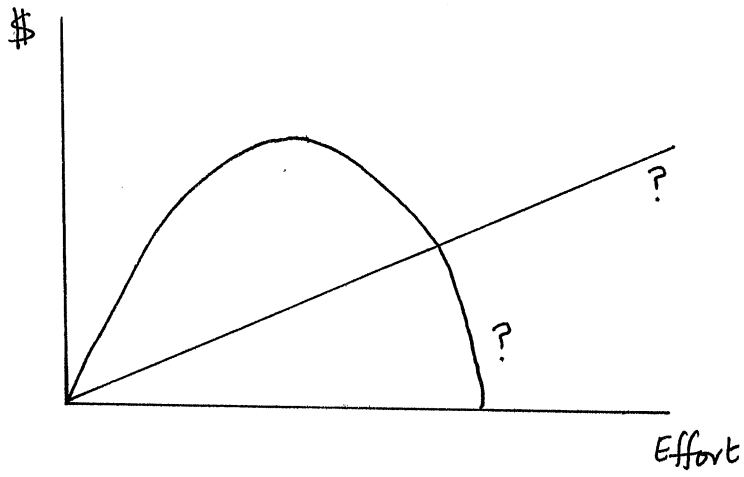
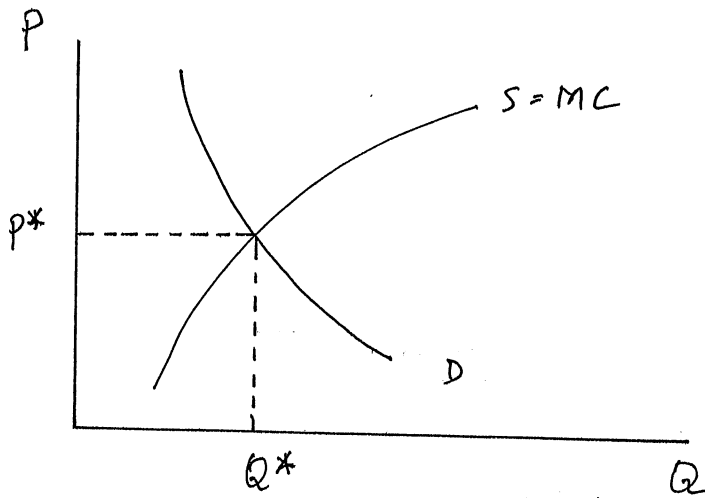


Fig. 3



F103 Ex. 2 Answers

① Standard: both firms at  $S_2$ , abatement  $2S_2$

total abatement cost = area under marginal abatement cost curve 1

$$\left. \begin{aligned} TAC_1 &= 0DS_2 \\ TAC_2 &= 0FS_2 \end{aligned} \right\} \text{sum is } 0DS_2 + 0FS_2 \quad \text{1}$$

Tax at "A":

Firm 1 goes to B (if left of B,  $MAC < \text{tax}$ , better to abate more)  
 (if right of B,  $\text{tax} < MAC$ , better to pay the tax than to abate more)

$$TAC_1 = 0BS_1$$

$$TAC_2 = 0GS_3 \text{ similarly}$$

$$\text{Sum is } 0BS_1 + 0GS_3 \quad \text{1}$$

Don't award the point if there's no explanation like

$$\text{Abatement is } S_1 + S_3 = S_1 + (S_2 - S_1)$$

abate more

$$\begin{aligned} \text{Standard - Tax} &= 0DS_2 + 0GS_3 \\ &\quad - 0BS_1 - 0FS_2 \end{aligned}$$

$$BDS_2S_1 - FGS_3S_2 > 0$$

↓

$$\text{Proof: } BDS_2S_1 > BES_2S_1 = EGS_3S_2 > FGS_3S_2$$

Since  $BE = EG$

$$\begin{aligned} &= S_1 + (S_2 - S_1) - (S_3 - S_2) + S_3 \\ &= S_2 + S_2 = 2S_2 \text{ as before.} \end{aligned}$$

so standard is more costly and abates just as much!

② a) specifies type of equipment to be used  
 - that's all

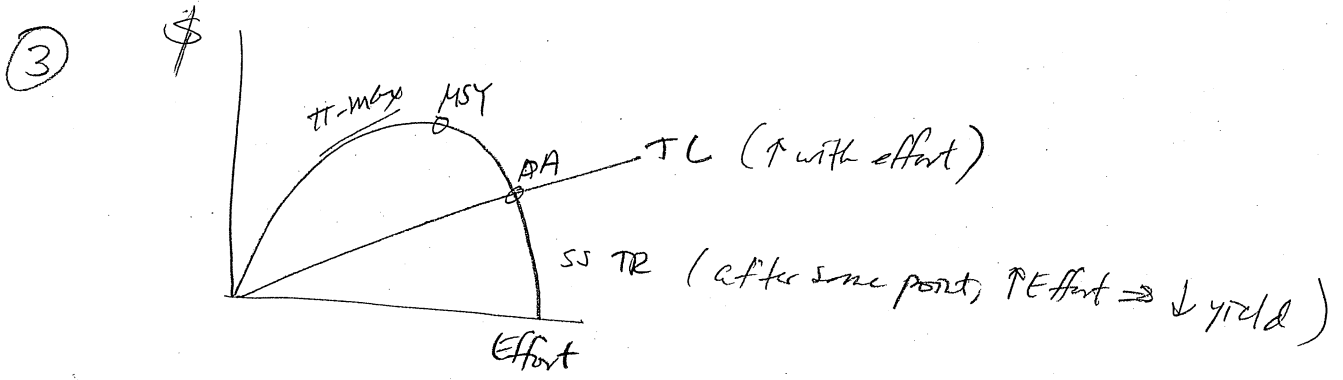
1 b) regulates air or water quality

2 c) sets pollution levels based on cost-benefit analysis

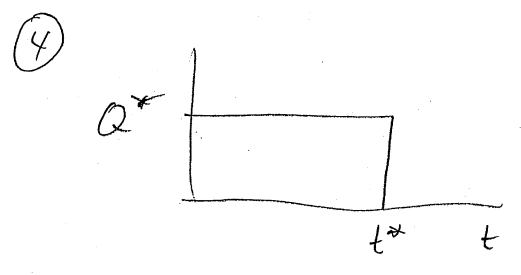
← least efficient (may be no impact on the environment)

← medium efficient (doesn't take costs explicitly into account)

by definition, most efficient



- 1 a) TR, TC
- 1 b) OA due to entry/exit
- 1 c) max (TR-TC)
- 1 d) MSY highest TR ⇒ highest yield



∵ Producing at  $Q^*$  as long as you can then at  $t^*$ ,  $P$  will jump up, this'll be foreseen, so firms will want to move some production to after  $t^*$ , which contracts the premise.

Producing at  $Q^*$  forever is not feasible. (You'll run out in  $S/Q^*$  years where  $S$  is the stock.)

User cost ignored

- ⑤
- 1) reduce waste ⇒ ↑  $\pi$
  - 2) green image attract customers + employees
  - 3) env. cleanup firms benefit
  - 4) anticipate future regulations
    - more time to adjust
    - better position vs. your competitors
    - influence the debate
  - 5) "commitment" ?

⑥ 2 a) tax on input materials used to produce something else

1 ~~a~~ b) " " finished product

1 c) " " throwing away something