

Place your name on the back of this sheet of paper and nowhere else. Staple your answers face up on the front of this sheet of paper. Failure to follow these directions will cost you 1 point. Your assignment will be typed, except graphs can be drawn by hand and mathematical equations can be done by hand. Failure to type it will cost you 10 points. If you use double-sided printing or print on the back of scrap paper, I will give you one additional point.

- 1) (10 points) Prove that $MC = MB$ is the optimal point.
- 2) (25 points) Draw the supply and demand for a good which creates pollution like gasoline. Prove that the equilibrium is not the socially optimal point. Illustrate the effects of the method which economists feel should be used to reduce pollution. Explain how that will reach the socially optimal point.
- 3) (15 points each) Define what is meant and explain why it is an economic reason for having a government. Note that one is not listed in the book as an economic reason, but there is an economic reason.
 - A) Income redistribution
 - B) Promote competition
 - C) Public good
- 4) (20 points) Suppose a person has an income of \$50,000. If they are facing the tax brackets below, then what are their marginal tax rate, total taxes paid, and average tax rate? Show all work. If there is no work, then state how you found the answer.

Income bracket	Tax rate
\$0 - \$20,000	0%
\$20,000 - \$45,000	20%
\$45,000 - \$100,000	40%
>\$100,000	50%