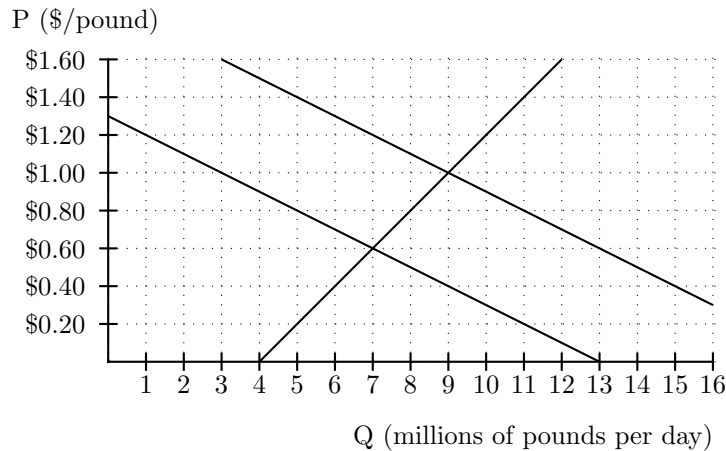


Spring 2005 Final Exam (100 Points Total)  
**Answer Key**

1. (a) Backward induction predicts an outcome of (3, 3).  
(b) No; a Pareto improvement is (6, 6).
2. (a) A Pareto efficient allocation of resources may not be good because of equity concerns or other considerations. For example, it would be Pareto efficient for Bill Gates to own everything (or for one kid to get the whole cake), but we might not find these to be very appealing resource allocations.  
(b) A Pareto inefficient allocation is in some meaningful sense bad because it's possible to make someone better off without making anybody else worse off, so why not do it?
3. (a) There are a number of examples in the text.  
(b) Anything from the traffic problem to the pollution problem to the public-private investment game to the original prisoner's dilemma which gives the problem its name.
4. The amount that buyers want to buy at the market equilibrium price is equal to the amount that sellers want to sell at that price. At a lower price, buyers want to buy more units than sellers want to sell; this creates incentives that push the price up towards equilibrium. At a higher price, sellers want to sell more units than buyers want to buy; this creates incentives that push the price down towards equilibrium.
5. (a) No, this is a sunk cost.  
(b) Use the present value of a lump sum formula to get a present value of  $\frac{\$500}{1.05} \approx \$476.19$ .  
(c) Use the present value of a perpetuity formula to get a present value of  $\frac{\$20}{.05} = \$400$ . So it's better to rent.  
(d) "Jack, I disagree with you. Instead of paying \$450 today to buy a steam-cleaner, I'd rather put that \$450 in the bank and 'live off the interest'. At the end of every year I'd have \$22.50 in interest, which would pay for the annual rental of a steam-cleaner *and* leave me with \$2.50 left over for wild parties." (Alternately, you could put \$50 towards a wild party today and put the remaining \$400 in the bank; the interest payments would then be \$20 per year, exactly enough to rent a steam-cleaner.)
6. Solving the demand and supply curves simultaneously yields a market equilibrium of  $p = 4$  and  $q = 140$ . The tax has no impact on the supply curve, but the demand curve changes to  $q = 220 - 20(1.25p)$ .



7. Below is a hypothetical market for oranges.

**Suppose that the government decides to impose a per-unit tax of \$.60 per pound on the buyers of oranges.**

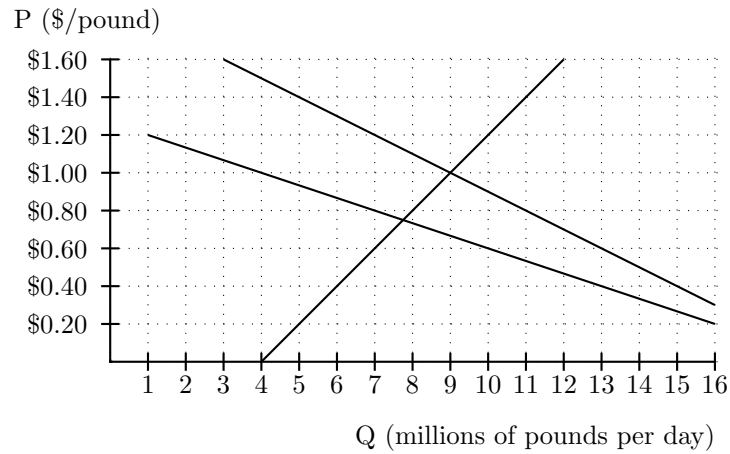
(a) At a market price of, say, \$1.00, buyers have to pay an extra \$.60 in tax, so they are effectively paying \$1.60 per pound. So they should be willing to buy at a market price of \$1.00 with the tax as much as they were willing to buy at a market price of \$1.60 without the tax. Another approach: the marginal benefit curve shifts down by \$.60 because the marginal benefit of each unit is reduced by that amount by the tax.

(b) The new equilibrium price is \$.60 per pound. Buyers used to pay \$1.00 per pound, but now pay \$.60 to the sellers and \$.60 to the government for a total of \$1.20, \$.20 more than before. Sellers used to receive \$1.00 per pound; now they receive \$.60, \$.40 per pound less than before.

The ratio of the tax burdens is  $\frac{T_B}{T_S} = \frac{.2}{.4} = \frac{1}{2}$ .

(c) The price elasticity of supply is about .556; the price elasticity of demand is about  $-1.111$ . Their ratio is  $-\frac{1}{2}$ , which is of the same magnitude as the ratio of the tax burdens!

(d) The demand curve rotates downward as shown. At a price of \$.40 per pound, for example, buyers would effectively be paying \$.60 per pound, so at a price of \$.40 with a 50% tax they should be willing to buy as much as they were willing to buy at a price of \$.60 per pound without the tax.



8. The Fed will increase the money supply by buying government bonds. This lowers the equilibrium interest rate, which boosts investment and shifts AD to the right.
9. The President and Congress can cut taxes on individuals and businesses. This increases the household and investment components of aggregate demand, thereby shifting AD to the right.
10. In the short run, shifting AD to the right increases the price level and real GDP. In the long run, shifting AD to the right increases the price level but does not increase real GDP, which is determined by real factors such as productivity, technological change, and population growth.