quarters of the year from 2007 through Q1 of 2012. Compare the number of cases in this graph with Figure A, which included safeguard (SF), China safeguard (CSF), antidumping (AD), and countervailing duty (CVD) cases. What can you conclude about the total number of SF, CSF, and CVD cases as compared with the number of AD cases?

e. The data used for Figures A, B, C run through 2011 or the first quarter of 2012. This information has been updated at the "Temporary Trade Barriers Database" of the World Bank. Google that database to locate it (or locate it through www.brandeis.edu/~cbown/global_ad/). Use the links provided to update the figures shown in this problem. That is, for a more recent year, what are: (i) the total number of newly initiated trade remedy actions (including SF, AD and CVD); (ii) the number of safeguard (SF) action; (iii) the number of antidumping (AD) actions; and (iv) the number of countervailing duty (CVD) actions? How do these numbers compare with 2011 and other past years as shown in the figures?

2. Figure 9-1 shows the Home no-trade equilibrium under perfect competition (with the price P^C) and under monopoly (with the price P^M). In this problem, we compare the welfare of Home consumers in these two situations.

   a. Under perfect competition, with the price P^C, label the triangle of consumer surplus and the triangle of producer surplus. Outline the area of total Home surplus (the sum of consumer surplus and producer surplus).

   b. Under monopoly, with the price P^M, label the consumer surplus triangle.

   c. Producer surplus is the same as the profits earned by the monopolist. To measure this, label the point in Figure 9-1 where the MR curve intersects MC at point B'. For selling the units between zero and Q^M, marginal costs rise along the MC curve, up to B'. The monopolist earns the difference between the price P^M and MC for each unit sold. Label the difference between the price and the MC curve as producer surplus, or profits.

   d. Outline the area of total Home surplus with a Home monopoly.

   e. Compare your answers to parts (a) and (d), and outline what the difference between these two areas is. What is this difference called and why?

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Figure 9-2 shows the free-trade equilibrium under perfect competition and under monopoly (both with the price P^W). In this problem, we compare the welfare of Home consumers in the no-trade situation and under free trade.

a. Under perfect competition, with the price P^W, label the triangle of consumer surplus and the triangle of producer surplus. Outline the area of total Home surplus (the sum of consumer surplus and producer surplus).

b. Based on your answers to part (a) in this problem and part (a) of the last problem, outline the area of gains from free trade under perfect competition.

c. Under monopoly, still with the price P^W, again label the triangle of consumer surplus and the triangle of producer surplus.

d. Based on your answers to part (c) in this problem and part (d) in the last problem, outline the area of gains from free trade under Home monopoly.

e. Compare your answers to parts (b) and (d). That is, which area of gains from trade is higher and why?

3. Rank the following in descending order of Home welfare and justify your answers. If two items are equivalent, indicate this accordingly.

   a. Tariff t in a small country with perfect competition

   b. Tariff t in a small country with a Home monopoly

   c. Quota with the same imports M in a small country, with a Home monopoly

   d. Tariff t in a country facing a Foreign monopoly

4. Refer to the prices of Japanese auto imports under the VER (Figure 9-5) and answer the following:

   a. What component of the price of imported automobiles from Japan rose the most over the period 1980 to 1985?

   b. Sketch how Figures 9-5 and 9-6 might have looked if the United States had applied a tariff to Japanese auto imports instead of

the VER (with the same level of imports). In words, discuss how the import prices and U.S. prices might have compared under a tariff and the VER.

c. Which policy—a tariff or the VER—would have been least costly to U.S. consumers?

5. In this problem, we analyze the effects of an import quota applied by a country facing a Foreign monopolist. In Figure 9-7, suppose that the Home country applies an import quota of X_2, meaning that the Foreign firm cannot sell any more than that amount.

   a. To achieve export sales of X_2, what is the highest price that the Foreign firm can charge?

   b. At the price you have identified in part (a), what is the Home consumer surplus?

   c. Compare the consumer surplus you identify in part (b) with the consumer surplus under free trade. Therefore, outline in Figure 9-7 the Home losses due to the quota. *Hint:* Remember that there is no Home firm, so you do not need to take into account Home producer surplus or tariff revenue. Assume that quota rents go to Foreign firms.

   d. Based on your answer to (c), which has the greater loss to the Home country—a tariff or a quota, leading to the same level of sales X_2 by the Foreign firm?

6. Suppose that the demand curve for a good is represented by the straight line

$$P = 20 - 2Q$$

Fill in the missing information in the following chart:

Quantity	Price	Total Revenue	Marginal Revenue
0			NA
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

   a. Draw a graph containing both the demand curve and marginal revenue curve.

   b. Is the marginal revenue curve a straight line as well? What is the slope of the marginal revenue curve? How does that slope compare with that of the demand curve?

   c. Does the marginal revenue curve contain negative values over the specified range of quantities? Explain why or why not.

7. Consider the case of a Foreign monopoly with no Home production, shown in Figure 9-7. Starting from free trade at point A, consider a $5 tariff applied by the Home government.

   a. If the demand curve is linear, as in Problem 6, what is the shape of the marginal revenue curve?

   b. How much does the tariff-inclusive Home price increase because of the tariff, and how much does the net-of-tariff price received by the Foreign firm fall?

   c. Discuss the welfare effects of implementing the tariff. Use a graph to illustrate under what conditions, if any, there is an increase in Home welfare.

8. Suppose the Home firm is considering whether to enter the Foreign market. Assume that the Home firm has the following costs and demand:

Fixed costs	=	$100
Marginal costs	=	$15 per unit
Local price	=	$30
Local quantity	=	40
Export price	=	$25
Export quantity	=	20

   a. Calculate the firm's total costs from selling only in the local market.

   b. What is the firm's average cost from selling only in the local market?

   c. Calculate the firm's profit from selling only in the local market.

   d. Should the Home firm enter the Foreign market? Briefly explain why.

   e. Calculate the firm's profit from selling to both markets.

   f. Is the Home firm dumping? Briefly explain.

9. Suppose that in response to a *threatened* antidumping duty of t, the Foreign monopoly raises its price by the amount t.
   a. Illustrate the losses for the Home country.
   b. How do these losses compare with the losses from a safeguard tariff of the amount t, applied by the Home country against the Foreign monopolist?
   c. In view of your answers to (a) and (b), why are antidumping cases filed so often?

10. Why is it necessary to use a market failure to justify the use of infant industry protection?

11. What is a positive externality? Explain the argument of knowledge spillovers as a potential reason for infant industry protection.

12. If infant industry protection is justified, is it better for the Home country to use a tariff or a quota, and why?

Department of Commerce. (If you are using this textbook in another country, you should try to answer this question using the customs statistics for your own country.)

a. Start at the webpage http://www.trade.gov/, and find Trade Stats Express under the Data & Analysis tab. Choose National Trade Data, and Product Profiles of U.S. Merchandise Trade with a Selected Market. Select China as a Trade Partner, and select Imports. On this page, categories of goods are identified by their Harmonized System (HS) codes. The HS codes for products can have 2 digits or 4 digits; you should choose 4 digits. Change the product from HS-total to the HS code 28, and display the U.S. imports from China within this HS code. You will find two 4-digit HS codes that include RARE_EARTH within their names. What are these codes? Graph the value of U.S. imports in each of these codes for 2007–15. What do you notice about the graphs during the key period 2010–12?

b. Subtract the U.S. imports for these two HS codes from the *total* imports within HS 28 (as shown at the top of the display), and call this the *remaining imports*. Then graph the remaining imports over 2007–15. How does the shape of this graph compare with those in part (a)?

c. Now inspect the value of imports for all other 4-digit HS codes within this category of HS 28. Are there any other codes that show a marked increase during 2011, with a reduction after that? What are these other codes? By inspection of their names, could these other codes include rare earth minerals?

2. Describe the impact of each of the following goals from the Hong Kong WTO meeting on (i) domestic prices and welfare of the country taking the action and (ii) world prices and welfare for the partner countries.

a. Elimination of agriculture export subsidies

b. Reduction of agricultural tariffs

c. Duty-free, quota-free access for 97% of goods originating in the world's least-developed countries

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Consider a large country with export subsidies in place for agriculture. Suppose the country changes its policy and decides to cut its subsidies in half.

a. Are there gains or losses to the large country, or is it ambiguous? What is the impact on domestic prices for agriculture and on the world price?

b. Suppose a small food-importing country abroad responds to the lowered subsidies by lowering its tariffs on agriculture by the same amount. Are there gains or losses to the small country, or is it ambiguous? Explain.

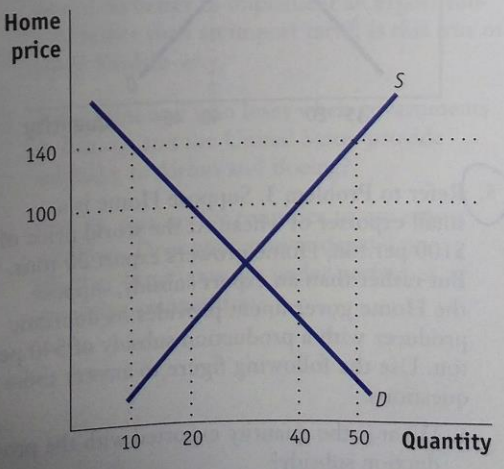
c. Suppose a large food-importing country abroad reciprocates by lowering its tariffs on agricultural goods by the same amount. Are there gains or losses to this large country, or is it ambiguous? Explain.

3. Suppose Home is a small exporter of wheat. At the world price of $100 per ton, Home growers export 20 tons. Now suppose the Home government decides to support its domestic producer with an export subsidy of $40 per ton. Use the following figure to answer these questions.

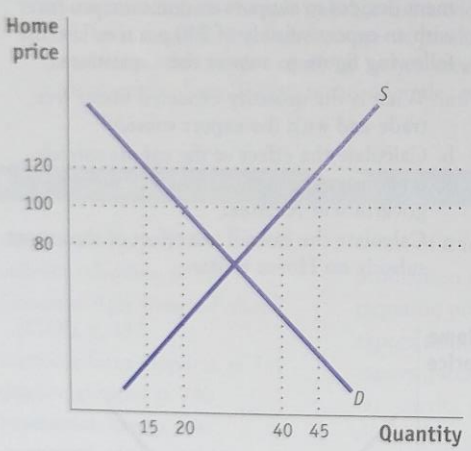
a. What is the quantity exported under free trade and with the export subsidy?

b. Calculate the effect of the export subsidy on consumer surplus, producer surplus, and government revenue.

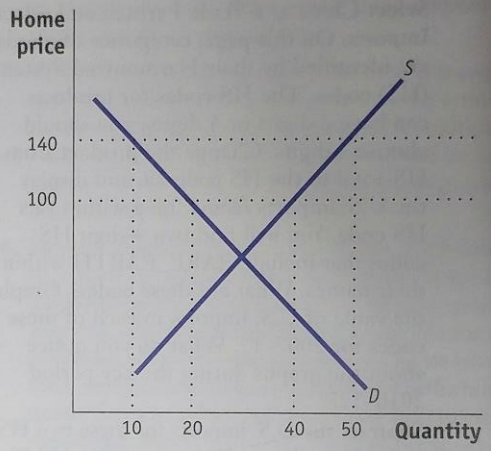
c. Calculate the overall net effect of the export subsidy on Home welfare.



4. Refer to Problem 3. Rather than a small exporter of wheat, suppose that Home is a large country. Continue to assume that the free-trade world price is $100 per ton and that the Home government provides the domestic producer with an export subsidy in the amount of $40 per ton. Because of the export subsidy, the local price increases to $120, while the foreign market price declines to $80 per ton. Use the following figure to answer these questions.
   a. Relative to the small-country case, why does the new domestic price increase by less than the amount of the subsidy?
   b. Calculate the effect of the export subsidy on consumer surplus, producer surplus, and government revenue.
   c. Calculate the overall net effect of the export subsidy on Home welfare. Is the large country better or worse off as compared to the small country with the export subsidy? Explain.



5. Refer to Problem 3. Suppose Home is a small exporter of wheat. At the world price of $100 per ton, Home growers export 20 tons. But rather than an export subsidy, suppose the Home government provides its domestic producer with a production subsidy of $40 per ton. Use the following figure to answer these questions.
   a. What is the quantity exported with the production subsidy?
   b. Calculate the effect of the production subsidy on consumer surplus, producer surplus, and government revenue.
   c. Calculate the overall net effect of the production subsidy on Home welfare. Is the cost of the production subsidy more or less than the cost of the export subsidy for the small country? Explain.



6. Explain why the WTO is more concerned with the use of direct export subsidies than production subsidies in achieving the same level of domestic support.

7. Boeing and Airbus are the world's only major producers of large wide-bodied aircrafts. But the increasing cost of fuel and the changing demand in the airline industry increases the need for smaller regional jets. Suppose that both firms must decide whether they will produce a smaller plane. We will assume that Boeing has a slight cost advantage over Airbus in both large and small planes, as shown in the payoff matrix that follows (in millions of U.S. dollars). Assume that each producer chooses to produce only large, only small, or no planes at all.
   a. What is the Nash equilibrium of this game?
   b. Are there multiple equilibria? If so, explain why. *Hint:* Guess at an equilibrium and then check whether either firm would want

		Airbus		
		Large planes	Small planes	Not produce
Boeing	Large planes	−5, 10	125, 115	0, 115
	Small planes	100, 150	0, 15	0, 150
	Not produce	100, 0	125, 0	0, 0

to change its action, given the action of the other firm. Remember that Boeing can change only its own action, which means moving up or down a column, and Airbus can change only its own action, which means moving back or forth on a row.

8. Refer to Problem 7. Now suppose the European government wants Airbus to be the sole producer in the lucrative small-aircraft market. Then answer the following:
   a. What is the minimum amount of subsidy that Airbus must receive when it produces small aircraft to ensure that outcome as the unique Nash equilibrium?
   b. Is it worthwhile for the European government to undertake this subsidy?

9. Here we examine the effects of domestic sales taxes on the market for exports, as an example of the "targeting principle." For example, in the domestic market, there are heavy taxes on the purchase of cigarettes. Meanwhile, the United States has several very large cigarette companies that export their products abroad.
   a. What is the effect of the sales tax on the quantity of cigarette exports from the United States? *Hint:* Your answer should parallel the case of production subsidies but for a consumption tax instead.
   b. How does the change in exports, if any, due to the sales tax compare with the effect of an export subsidy on cigarettes?

10. Refer to Problem 9. Based on your answer there, would foreign countries have a reason to object to the use of a sales tax on cigarettes by the United States? Based on your knowledge of the GATT/WTO provisions (see **Side Bar: Key Provisions of the GATT** in Chapter 8), are foreign countries entitled to object to the use of such a tax?

11. To improve national welfare, a large country would do better to implement an export subsidy rather than an import tariff. Is this true or false? Explain why.

12. Who gains and who loses when governments in Europe and the United States provide subsidies to Airbus and Boeing?

13. Provide reasons for countries to use export subsidies. Does your answer depend on whether firms compete under perfect or imperfect competition?

2. a. How is a customs union different from a free-trade area? Provide examples of each.
   b. Why do some economists prefer multilateral trade agreements over regional trade agreements?
3. Figure 11-2 shows the tariff game between Home and Foreign, both large countries.
   a. Redraw the payoff matrix for a game between a large and small country.
   b. What is/are the Nash equilibrium/equilibria, assuming that the large country applies an optimal tariff?
   c. What does your answer to (b) tell you about the role of the WTO in a situation like this?

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Consider the following variation of Table 11-1 for the U.S. semiconductor market:

	U.S. Tariff		
	0%	8%	16%
From Canada, before NAFTA	$45	$W	$52.2
From Asia, before NAFTA	$40	$X	$Y
From Canada, after NAFTA	$43	$Z	$Z
From Asia, after NAFTA	$40	$X	$Y
From the United States	$46	$46	$46

a. Fill in the values for *W*, *X*, *Y*, and *Z*.

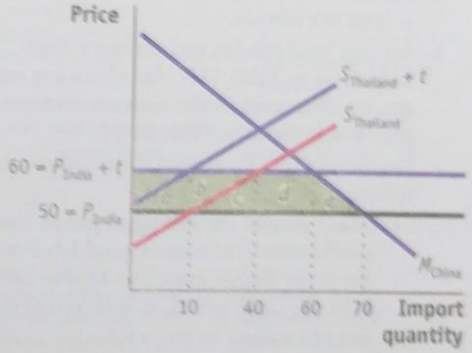
b. Suppose that before NAFTA, the United States had a 16% tariff on imported semiconductors. Which country supplied the U.S. market? Is it the lowest-cost producer?

c. After NAFTA, who supplies the U.S. market? Has either trade creation or diversion occurred because of NAFTA? Explain.

d. Now suppose that before NAFTA, the United States had an 8% tariff on imported semiconductors. Then repeat parts (b) and (c).

e. In addition to the assumptions made in (d), consider the effect of an increase in high-technology investment in Canada due to NAFTA, allowing Canadian firms to develop better technology. As a result, *three years after the initiation of NAFTA*, Canadian firms can begin to sell their products to the United States for $40. What happens to the U.S. trade pattern three years after NAFTA? Has either trade creation or diversion occurred because of NAFTA? Explain.

4. Assume that Thailand and India are potential trading partners of China. Thailand is a member of ASEAN but India is not. Suppose the import price of textiles from India (P_{India}) is 50 per unit under free trade and is subject to a 20% tariff. As of January 1, 2010, China and Thailand entered into the China–ASEAN free-trade area, eliminating tariffs on Thai imports. Use the following figure to answer the questions:



   a. Before the China–ASEAN free-trade area, how much does China import from each trading partner? What is the import price? Calculate the tariff revenue.
   b. After the China–ASEAN free-trade area, how much does China import from each trade partner? What is the import price? What is the total tariff revenue of China?
   c. Based on your answer to part (b), what is the impact of the China–ASEAN free-trade area on the welfare of China?
   d. What is the effect of the China–ASEAN free-trade area on the welfare of Thailand and India?
   e. The China–ASEAN agreement may lead to a similar one between China and India. How would this affect China's imports from each country? What would be the effect on welfare in China, Thailand, and India if such an agreement was signed?
5. Redraw the graph of trade diversion (Figure 11-3) with the S'_{Mex} curve intersecting the M_{US} curve *between* points *A* and *D*.
   a. When the United States and Mexico join NAFTA, who supplies auto parts to the United States? Does the United States

import a larger quantity of auto parts after NAFTA; that is, does trade creation occur?

b. What is the change in government revenue compared with before NAFTA?

c. Is the United States better off for joining NAFTA?

6. Refer to the survey in Table 11-2 regarding consumers' attitudes toward working conditions.

a. Fill in the survey questions for yourself and at least five friends.

b. Average your results, and compare them with those in Table 11-2. Are there any consistent differences in the answers from your friends and those in Table 11-2?

c. Do the answers from your friends show the following two characteristics?

i. Many people are willing to pay at least a small amount to ensure good labor standards (or simply switch to an alternative with the same price), though relatively few are willing to pay a lot.

ii. Individuals had to receive a higher discount to purchase a T-shirt made under poor conditions than they were willing to pay for a T-shirt made under good conditions.

Explain whether these characteristics apply to your friends.

7. Using Table 11-3, explain why environmentalists have "lost the battle but won the war" in their dealings with the WTO. Refer to specific WTO cases in your answer.

8. Refer to Figure 11-4 when answering this question.

a. Redraw Figure 11-4, panel (a), assuming that the production externality is positive so that the *SMC* curve lies below the supply curve. Label the area *c* that reflects the change in the cost of the externality that arises when trade is opened. Is this area an additional social gain from free trade or an offsetting cost? Can you think of a real-world example of this case?

b. Redraw Figure 11-4, panel (b), assuming that the consumption externality is positive so that the *SMB* curve lies above the demand curve. Label the area *d* that arises when trade is opened, and explain why this area is an additional social gain from free trade. (You can refer to the discussion of solar panels earlier in the chapter.)

9. Refer to following variations of the payoff matrix for the environmental game shown in Figure 11-7. In this problem, a number is assigned to represent the welfare level of each outcome for Home and Foreign.

a. First, consider the case of global pollution in which the government puts more weight on producer profits than consumer well-being when calculating welfare (this is so since a portion of consumer costs are borne by the other country). How can you tell that the government favors producers over consumers from the following payoff matrix? What is the Nash equilibrium for this environmental game? Is it a prisoner's dilemma? Briefly explain.

Home \ Foreign	Regulate	Don't regulate
Regulate	80, 80	100, 50
Don't regulate	50, 100	70, 70

b. Next, consider the case of local pollution in which the government puts more weight on consumer well-being than producer profits when calculating welfare. How can you tell that the government favors consumers over producers from the following payoff matrix? What is the Nash equilibrium for this environmental game? Is it a prisoner's dilemma? Briefly explain.

Home \ Foreign	Regulate	Don't regulate
Regulate	70, 70	50, 70
Don't regulate	70, 50	50, 50