Chapter 1

3. If you are thinking of going skiing instead of working at your part-time job, the cost of skiing includes its monetary and time costs, which includes the opportunity cost of the wages you are giving up by not working. If the choice is between skiing and going to the library to study, then the cost of skiing is its monetary and time costs including the cost to you of getting a lower grade in your course.

5. The fact that you've already sunk $5 million isn't relevant to your decision anymore, since that money is gone. What matters now is the chance to earn profits at the margin. If you spend another $1 million and can generate sales of $3 million, you'll earn $2 million in marginal profit, so you should do so. You are right to think that the project has lost a total of $3 million ($6 million in costs and only $3 million in revenue) and you shouldn't have started it. That's true, but if you don't spend the additional $1 million, you won't have any sales and your losses will be $5 million. So what matters is not the total profit, but the profit you can earn at the margin. In fact, you'd pay up to $3 million to complete development; any more than that, and you won't be increasing profit at the margin.

6. Harry suggests looking at whether productivity would rise or fall. Productivity is certainly important, since the more productive workers are, the lower the cost per gallon of potion. Ron wants to look at average cost. But both Harry and Ron are missing the other side of the equation—revenue. A firm wants to maximize its profits, so it needs to examine both costs and revenues. Thus, Hermione is right—it's best to examine whether the extra revenue would exceed the extra costs. Hermione is the only one who is thinking at the margin.

9. By specializing in each task, you and your roommate can finish the chores more quickly. If you divided each task equally, it would take you more time to cook than it would take your roommate, and it would take him more time to clean than it would take you. By specializing, you reduce the total time spent on chores.

Similarly, countries can specialize and trade, making both better off. For example, suppose it takes Spanish workers less time to make clothes than French workers, and French workers can make wine more efficiently than Spanish workers. Then Spain and France can both benefit if Spanish workers produce all the clothes and French workers produce all the wine, and they exchange some wine for some clothes.
2. a. Steel is a fairly uniform commodity, though some firms produce steel of inferior quality.
   b. Novels are each unique, so they are quite distinguishable.
   c. Wheat produced by one farmer is completely indistinguishable from wheat produced by another.
   d. Fast food is more distinguishable than steel or wheat, but certainly not as much as novels.

4. a. Figure 6 shows a production possibilities frontier between guns and butter. It is bowed out because when most of the economy’s resources are being used to produce butter, the frontier is steep and when most of the economy’s resources are being used to produce guns, the frontier is very flat. When the economy is producing a lot of guns, workers and machines best suited to making butter are being used to make guns, so each unit of guns given up yields a large increase in the production of butter. Thus, the production possibilities frontier is flat. When the economy is producing a lot of butter, workers and machines best suited to making guns are being used to make butter, so each unit of guns given up yields a small increase in the production of butter. Thus, the production possibilities frontier is steep.
   b. Point A is impossible for the economy to achieve; it is outside the production possibilities frontier. Point B is feasible but inefficient because it’s inside the production possibilities frontier.

   ![Figure 6](image)

   c. The Hawks might choose a point like H, with many guns and not much butter. The Doves might choose a point like D, with a lot of butter and few guns.
   d. If both Hawks and Doves reduced their desired quantity of guns by the same amount, the Hawks would get a bigger peace dividend because the production possibilities frontier is much flatter at point H than at point D. As a result, the reduction of a given number of guns, starting at point H, leads to a much larger increase in the quantity of butter produced than when starting at point D.
5. See Figure 7. The shape and position of the frontier depend on how costly it is to maintain a clean environment—the productivity of the environmental industry. Gains in environmental productivity, such as the development of a no-emission auto engine, lead to shifts of the production-possibilities frontier, like the shift from PPF$_1$ to PPF$_2$ shown in the figure.