**Chapter 21**

1. Suppose a consumer only buys two goods: hot dogs and hamburgers. Suppose the price of hot dogs is €1, the price of hamburgers is €2, and the consumer's income is €20.

a. Plot the consumer's budget constraint in Exhibit 1. Measure the quantity of hot dogs on the vertical axis and the quantity of hamburgers on the horizontal axis. Explicitly plot the points on the budget constraint associated with the even numbered quantities of hamburgers (0, 2, 4, 6 . . .).
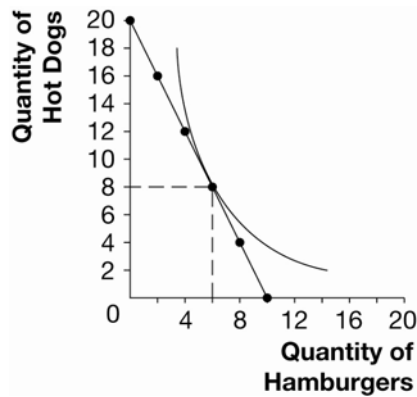
Exhibit 1
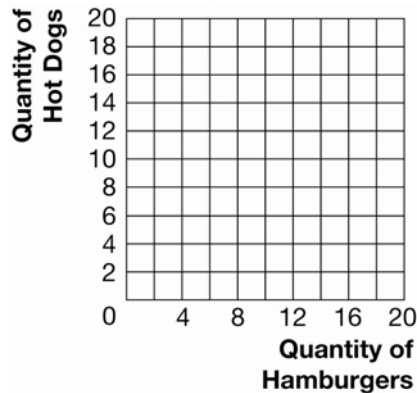
Answer:
See Exhibit 5.

Exhibit 5
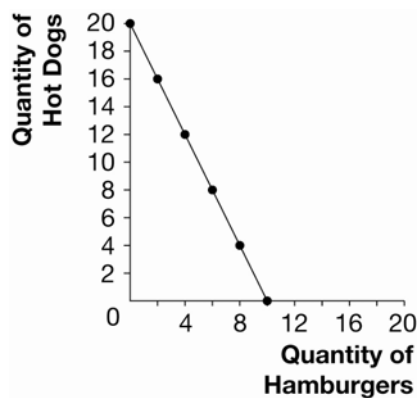
b. Suppose the individual chooses to consume six hamburgers. What is the maximum amount of hot dogs that he can afford? Draw an indifference curve on the figure above that establishes this bundle of goods as the optimum.

Answer:
Eight. For the indifference curve, see Exhibit 6.

Exhibit 6

c.   What is the slope of the budget constraint? What is the slope of the consumer's indifference curve at the optimum? What is the relationship between the slope of the budget constraint and the slope of the indifference curve at the optimum? What is the economic interpretation of this relationship?

Answer:
Rise over run = 2/1. This is also the price ratio of price of hamburgers to price of hot dogs = €2/€1. The slope of the indifference curve is also 2/1. (Note: all of these slopes are negative.) At the optimum, the indifference curve is tangent to the budget constraint so their slopes are equal. Thus, the trade-off between the goods that the individual is willing to undertake (*MRS*) is the same as the trade off that the market requires (slope of budget constraint).

d.   Explain why any other point on the budget constraint must be inferior to the optimum.

Answer:
Since the highest indifference curve reachable is tangent to the budget constraint, any other point on the budget constraint must have an indifference curve running through it that is below the optimal indifference curve so that point must be inferior to the optimum.

2. Use Exhibit 2 to answer the following questions.

Exhibit 2
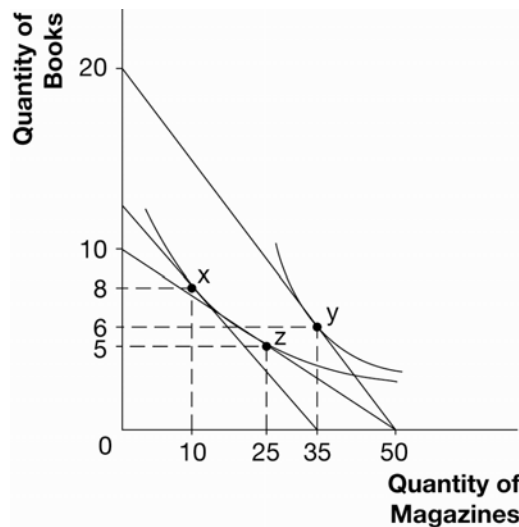
a. Suppose the price of a magazine is €2, the price of a book is €10, and the consumer's income is €100. Which point on the graph represents the consumer's optimum: X, Y, or Z? What are the optimal quantities of books and magazines this individual chooses to consume?

Answer:
Point Z. 25 books and five magazines.

b. Suppose the price of books falls to €5. What are the two optimum points on the graph that represent the substitution effect (in sequence)? What is the change in the consumption of books due to the substitution effect?

Answer:
From point Z to point X. From five books to eight books.

c. Again, suppose the price of books falls to €5. What are the two optimum points on the graph that represent the income effect (in sequence)? What is the change in the consumption of books due to the income effect? Is a book a normal good or an inferior good for this consumer? Explain.

Answer:
From point X to point Y. From eight books to six books. Books are inferior because an increase in income decreases the quantity demanded of books.
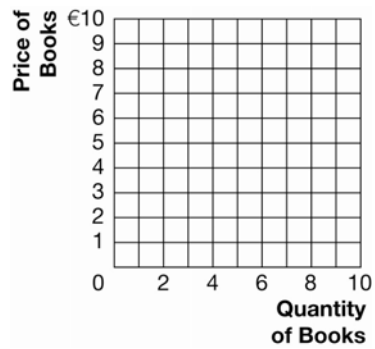
d. For this consumer, what is the total change in the quantity of books purchased when the price of books fell from €10 to €5?

Answer:
The quantity demanded increased from five books to six books.

e.   Use the information in this problem to plot the consumer's demand curve for books in Exhibit 3.

Exhibit 3

Answer:
See Exhibit 7.

Exhibit 7