Chapter 8 Question

Agatha must travel on the Orient Express from Istanbul to Paris. The distance is 1,500 miles. A traveler can choose to make any fraction of the journey in a first-class carriage and travel the rest of the way in a second-class carriage. The price is 10 cents a mile for a second-class carriage and 20 cents a mile for a first-class carriage. Agatha much prefers first-class to second-class travel, but because of a misadventure in an Istanbul bazaar, she has only $200 left with which to buy her tickets. Luckily, she still has her toothbrush and a suitcase full of cucumber sandwiches to eat on the way. Agatha plans to spend her entire $200 on her tickets for her trip. She will travel first class as much as she can afford to, but she must get all the way to Paris, and $200 is not enough money to get her all the way to Paris in first class.

(a) Using a dashed line, draw the locus of combinations of first- and second-class tickets that Agatha can just afford to purchase with her $200.

(b) Using a solid line, draw the locus of combinations of first and second-class tickets that are sufficient to carry her the entire distance from Istanbul to Paris.

(c) Label the combination of first- and second-class miles Agatha will choose A.

(d) Let \( m_1 \) be the number of miles she travels by first-class coach and \( m_2 \) be the number of miles she travels by second-class coach. Write down two equations that you can solve to find the number of miles she chooses to travel by first-class coach and the number of miles she chooses to travel by second-class coach.

(e) What is the number of miles that she travels by second-class coach?

(f) Just before she was ready to buy her tickets, the price of second-class tickets fell to $.05 while the price of first-class tickets remained at $.20. Using pluses draw the combinations of first-class and second-class tickets that she can afford with her $200 at these prices.

(g) Label the combination of first- and second-class miles from part (f) that Agatha will choose B.

(h) How many miles does she travel by second class with the changes from part (f)?

(i) Is second-class travel a normal good for Agatha? Explain.

(j) Is second-class travel a Giffen good for Agatha? Explain.

(k) Just after the price change from $.10 per mile to $.05 per mile for second-class travel, and just before she had bought any tickets, Agatha misplaced her handbag. Although she kept most of her money in her sock, the money she lost was just enough so that at the new prices, she could exactly afford the combination of first- and second-class tickets that she would have purchased at the old prices. How much money did she lose?

(l) Using a dotted line, draw the locus of combinations of first- and second-class tickets that she can just afford after discovering her loss.

(m) Label the combination of first- and second-class miles from part (l) that Agatha will choose C.

(n) How many miles will she travel by second-class now?

(o) Finally, poor Agatha finds her handbag again. How many miles will she travel by second-class now (assuming she didn’t buy any tickets before she found her lost handbag)?

(p) When the price of second-class tickets fell from $.10 to $.05, how much of a change in Agatha’s demand for second-class tickets was due to a substitution effect?

(q) When the price of second-class tickets fell from $.10 to $.05, how much of a change was due to an income effect?