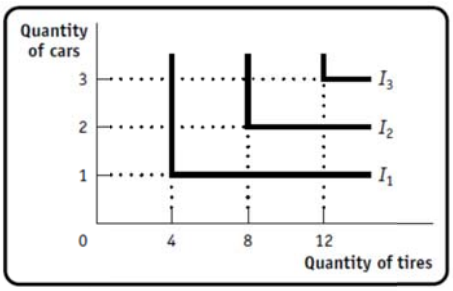
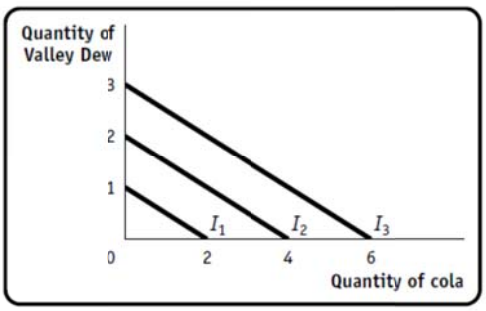
Practice EE211Answers

1. Following are Isabella's indifference curve maps for each of the situations described.

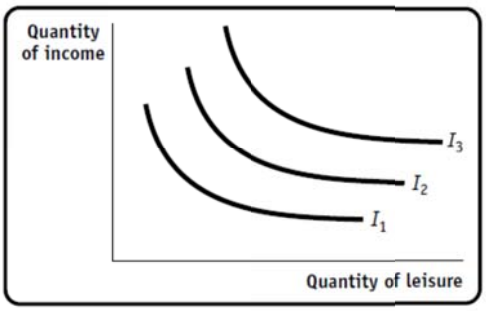
a.



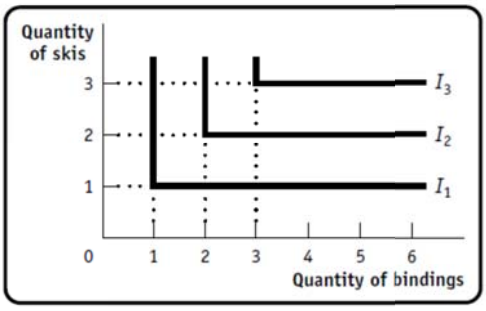
b.



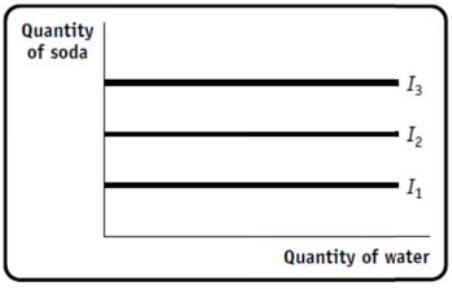
c.



d.



e.



2.
a. Because bundle *B* has more movie tickets and more cafeteria meals than bundle *A*, it is preferred. The reason is that more is better.

b. Compared to bundle *A*, bundle *B* has the same number of cafeteria meals but more movie tickets. Again, because more is better, bundle *B* is preferred.

c. Bundle *A* has more videos than bundle *B*, but bundle *B* has more bags of chips than bundle *A*. The "more is better" principle does not help us rank these two bundles. Without more information, they cannot be ranked.

d. Since we know that you are indifferent between bundle *A* and bundle *B*, we know that they lie on the same indifference curve. Note in the accompanying diagram that bundle *C* lies on a straight line between bundles *A* and *B*. Since we know that indifference curves for ordinary goods are convex (they get flatter as we move along them to the right), bundle *C* has to be on a higher indifference curve than bundle *A* (and bundle *B*). Since the number of goods in bundle *C* is exactly the average of the numbers in bundles *A* and *B*, sometimes this property of indifference curves is known as "averages are preferred to extremes."

3.
a. These indifference curves cross. One of the properties of indifference curves is that they never cross. This rules out indifference curves like these.

b. This indifference curve does not get flatter as you move along it to the right; instead, it gets steeper. The property that indifference curves for ordinary goods get flatter as you move to the right is a result of the assumption of diminishing marginal utility. So diminishing marginal utility rules out indifference curves like this.

c. This indifference curve satisfies all four properties of indifference curves for ordinary goods.

d. This curve has an upward-sloping segment. But such a curve is ruled out by the principle that more is better. On this indifference curve, there are at least two bundles that have the same amount of good *Y*, but one has more of good *X* than the other. Because more is better, these two bundles can't give the consumer the same total utility; the one with more of good *X* must give the consumer a higher level of total utility than the one with less. So they cannot be on the same indifference curve.

4. The relative price of one room in terms of restaurant meals is the number of restaurant meals that must be forgone to obtain 1 room. Since 5 restaurant meals must be forgone to obtain 1 room, the price of a restaurant meal has to be \$100/5 = \$20. If Neha spends all of her income on restaurant meals, she can buy \$1,000/\$20 = 50 restaurant meals.

5.
a. Ina's budget line is equally as steep. The slope of the budget line is minus the relative price of one good in terms of another. The relative prices of goods have not changed: all goods just cost 20% more.

b. The prices of all goods have increased by 20%, but Ina's income has increased by only 10%. Fewer bundles are now within Ina's consumption possibilities: the budget line has shifted inward.

6.
The relative price of CDs in terms of cups of hot chocolate is $P_{CD}/P_{hot\ chocolate}$ = \$10/\$2 = 5. That is, to get 1 more CD, Kory has to give up 5 cups of hot chocolate.

a. This bundle lies on Kory's budget line: it is a bundle at which she spends all her income. Kory's marginal rate of substitution is less than the relative price of CDs. She is willing to exchange only 1 cup of hot chocolate for 1 CD. However, the relative price of 1 CD is 5 cups of hot chocolate: she would have to give up 5 cups of hot chocolate for 1 CD. Kory values CDs less than they cost her, so she should consume fewer CDs and more hot chocolate to remain on her budget line. Kory should shift consumption toward hot chocolate until her *MRS* is the same as the relative price of CDs.

b. This bundle lies on Kory's budget line: it is a bundle at which she spends all her income. Kory's marginal rate of substitution is $MU_{CD}/MU_{hot\ chocolate}$ = 25/5 = 5. That is, she is willing to exchange 5 cups of hot chocolate for 1 CD. Because the relative price of 1 CD is 5 cups of hot chocolate, Kory values CDs equally as much as they cost her. So this is her optimal consumption bundle.

c. At this bundle, the marginal rate of substitution is equal to the relative price, but the bundle does not lie on Kory's budget line: she spends only \$30 on it. If her income were \$30, this would be her optimal consumption bundle. However, her income is \$50. At this higher income she will buy more of both goods, since both are normal goods for her.

7.
a. Raul's marginal rate of substitution is 1: he is willing to trade only 1 Nolan Ryan for 1 more Cal Ripken card.

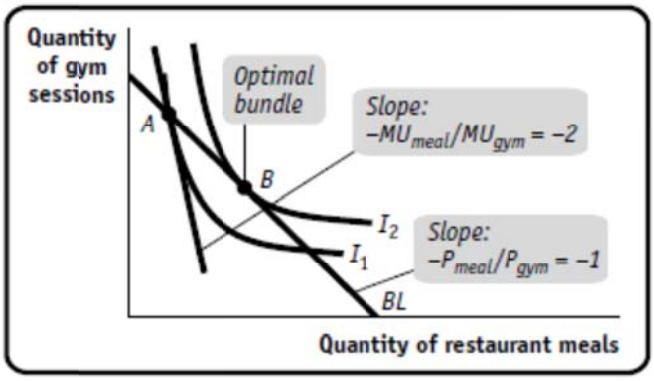
b. Raul's marginal rate of substitution is MU_{Cal}/MU_{Nolan} = 1. However, the relative price of a Cal Ripken card is P_{Cal}/P_{Nolan} = \$24/\$12 = 2. Since the marginal rate of substitution is less than the relative price, Raul can make himself better off by selling Cal Ripken cards and buying Nolan Ryan cards until his marginal rate of substitution equals the relative price.

c. If Raul can no longer benefit from trade, he must be consuming his optimal consumption bundle. That is, his marginal rate of substitution must be equal to the relative price. The relative price rule—which says that $MU_{Cal}/MU_{Nolan} = P_{Cal}/P_{Nolan}$— applies. Since we know that the relative price is 2, Raul's marginal rate of substitution must also be 2.

8.

a. Lauren is right. Since Ralph values one more meal twice as much as he values one more session at the gym, his marginal utility for meals is twice as much as his marginal utility for gym sessions. That is, his marginal rate of substitution of meals in place of gym sessions is MU_{meal}/MU_{gym} = 2. However, the relative price of a meal is P_{meal}/P_{gym} = 1 (they both cost the same). *A* in the accompanying diagram illustrates this bundle. Since his marginal rate

of substitution is different from the relative price, this cannot be his optimal consumption bundle.



b. Since Ralph's marginal rate of substitution is greater than the relative price of a meal, he should consume more meals and fewer gym visits to make himself better off. In the diagram, bundle *B* is the bundle that is optimal: the relative price is equal to Ralph's marginal rate of substitution.

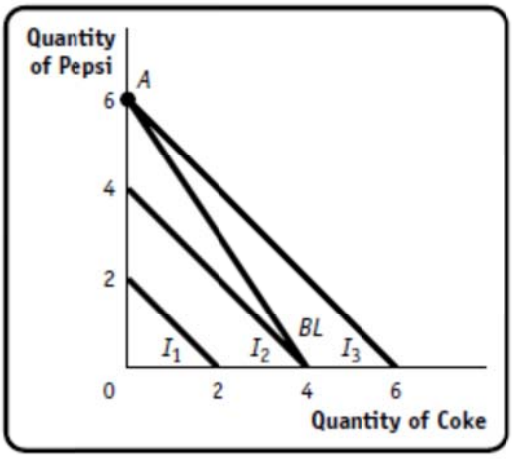
9.
a. If Sabine cannot tell the difference between Coke and Pepsi, the two are perfect substitutes for her. She is always willing to exchange 1 six-pack of Pepsi for 1 six-pack of Coke, so her marginal rate of substitution of Coke in place of Pepsi is 1.

b. Sabine's indifference curves are the lines labeled *I*1, *I*2, and *I*3 in the accompanying diagram.

c. Sabine's budget line is the line labeled *BL* in the diagram.

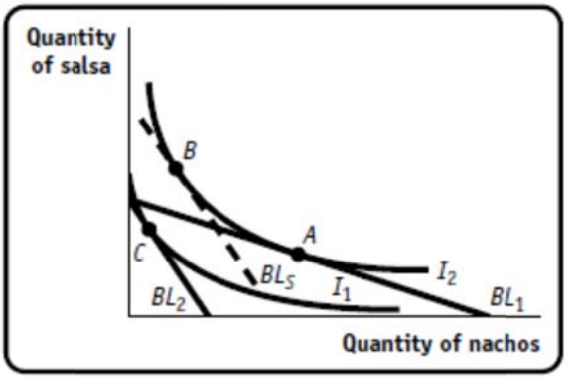
d. Sabine's optimal consumption bundle is bundle *A* in the diagram: she can get onto her highest indifference curve by consuming only Pepsi. (In this special case of perfect substitutes, the relative price rule does not hold. Sabine's marginal rate of substitution is less than the relative price, so she should want to consume less Coke and more Pepsi. But that is impossible since she is already consuming no Coke!)

e. If the price of Pepsi and Coke is the same, then the budget line has the same slope as Sabine's indifference curves. That is, at any bundle on the budget line, the relative price rule is true! In that case, we cannot predict what Sabine will do: any bundle on her budget line would be an optimal choice.

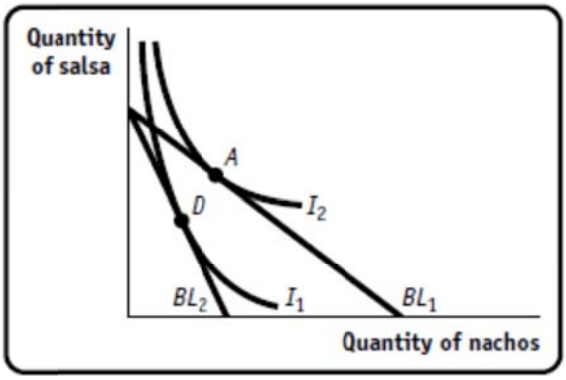


10.

a. In the accompanying diagram, *BL*1 is Norma's original budget line and *A* is her optimal consumption bundle. After the increase in the price of nachos, *BL*2 is her new budget line and *C* is her new consumption bundle. The movement from *A* to *B* isolates the pure substitution effect of the rise in the relative price of nachos: at *B* she consumes fewer nachos and more salsa. The movement from *B* to *C* isolates the income effect: she has been made poorer by the rise in the price of nachos, so she consumes fewer nachos at *C* than at *B*. Since nachos are a normal good, and the income and substitution effect run in the same direction when the price changes for a normal good, we can say definitively that her consumption of nachos falls in response to the increase in the price of nachos.



b. We cannot say definitively whether Norma's consumption of salsa rises or falls. In the diagram from part a, Norma's consumption of salsa rises in response to the increase in the price of nachos: she consumes more salsa at bundle *C* than she did at bundle *A*. Depending on her preferences, however, it is possible that her consumption of salsa falls as well. This will occur if the size of the income effect on salsa consumption from the price increase of nachos (which makes her poorer) is large enough to dominate the size of the substitution effect on salsa consumption (which makes her want to consume more salsa and fewer nachos). The accompanying diagram shows a case in which her consumption of salsa falls in response to an increase in the price of nachos. At her new consumption bundle *D*, she consumes fewer nachos *and* less salsa than she did at *A*.


Quantity of salsa
A
D
I_2
BL_2
I_1
BL_1
Quantity of nachos