

TEST BANK

Intermediate Microeconomics

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CONTENTS

Preface	vii		
Part I Test Bank			
Chapter 2 Budget Constraint	3	Chapter 23 Firm Supply	150
Chapter 3 Preferences	11	Chapter 24 Industry Supply	155
Chapter 4 Utility	17	Chapter 25 Monopoly	162
Chapter 5 Choice	24	Chapter 26 Monopoly Behavior	172
Chapter 6 Demand	32	Chapter 27 Factor Markets	177
Chapter 7 Revealed Preference	41	Chapter 28 Oligopoly	181
Chapter 8 Slutsky Equation	49	Chapter 29 Game Theory	189
Chapter 9 Buying and Selling	55	Chapter 30 Game Applications	195
Chapter 10 Intertemporal Choice	65	Chapter 31 Behavioral Economics	202
Chapter 11 Asset Markets	72	Chapter 32 Exchange	207
Chapter 12 Uncertainty	79	Chapter 33 Production	217
Chapter 13 Risky Assets	86	Chapter 34 Welfare	224
Chapter 14 Consumer's Surplus	89	Chapter 35 Externalities	228
Chapter 15 Market Demand	94	Chapter 36 Information Technology	235
Chapter 16 Equilibrium	105	Chapter 37 Public Goods	239
Chapter 17 Measurement	112	Chapter 38 Asymmetric Information	243
Chapter 18 Auctions	113	Part II Alternative Quizzes	
Chapter 19 Technology	119	Chapter 2 Budget Constraint	251
Chapter 20 Profit Maximization	125	Chapter 3 Preferences	256
Chapter 21 Cost Minimization	132	Chapter 4 Utility	261
Chapter 22 Cost Curves	143	Chapter 5 Choice	266
		Chapter 6 Demand	270

Chapter 7 Revealed Preference	275	Chapter 23 Firm Supply	341
Chapter 8 Slutsky Equation	280	Chapter 24 Industry Supply	343
Chapter 9 Buying and Selling	285	Chapter 25 Monopoly	348
Chapter 10 Intertemporal Choice	290	Chapter 26 Monopoly Behavior	353
Chapter 11 Asset Markets	294	Chapter 27 Factor Markets	356
Chapter 12 Uncertainty	299	Chapter 28 Oligopoly	360
Chapter 13 Risky Assets	304	Chapter 29 Game Theory	365
Chapter 14 Consumer's Surplus	306	Chapter 30 Game Applications	371
Chapter 15 Market Demand	311	Chapter 31 Behavioral Economics	377
Chapter 16 Equilibrium	315	Chapter 32 Exchange	378
Chapter 17 Measurement	319	Chapter 33 Production	384
Chapter 18 Auctions	320	Chapter 34 Welfare	389
Chapter 19 Technology	326	Chapter 35 Externalities	394
Chapter 20 Profit Maximization	330	Chapter 36 Information Technology	399
Chapter 21 Cost Minimization	333	Chapter 37 Public Goods	402
Chapter 22 Cost Curves	337	Chapter 38 Asymmetric Information	406

PREFACE

The second part of this volume consists of alternative quizzes for the multiple-choice questions in Bergstrom and Varian's *Workouts in Intermediate Microeconomics*. These questions use new parameters and scrambled responses so that an instructor can use them as a quiz or for more formal graded examinations.

A computerized version of this Test Bank is available at no charge to any instructor who adopts Hal Varian's *Intermediate Microeconomics, Ninth Edition* by contacting your local representative at 1-800-353-9909 or wwnorton.com.

PART I: TEST BANK

CHAPTER 2

Budget Constraint

TRUE/FALSE

1. If there are two goods with positive prices and the price of one good is reduced, while income and other prices remain constant, then the size of the budget set is reduced.

ANS: F DIF: 1

2. If good 1 is measured on the horizontal axis and good 2 is measured on the vertical axis and if the price of good 1 is p_1 and the price of good 2 is p_2 , then the slope of the budget line is $-p_2/p_1$.

ANS: F DIF: 1

3. If all prices are doubled and money income is left the same, the budget set does not change because relative prices do not change.

ANS: F DIF: 1

4. If there are two goods and if one good has a negative price and the other has a positive price, then the slope of the budget line will be positive.

ANS: T DIF: 1

5. If all prices double and income triples, then the budget line will become steeper.

ANS: F DIF: 1

6. If good 1 is on the horizontal axis and good 2 is on the vertical axis, then an increase in the price of good 1 will not change the horizontal intercept of the budget line.

ANS: F DIF: 1

7. If there are two goods and the prices of both goods rise, then the budget line must become steeper.

ANS: F DIF: 1

8. There are two goods. You know how much of good 1 a consumer can afford if she spends all of her income on good 1. If you knew the ratio of the prices of the two goods, then you could draw the consumer's budget line without any more information.

ANS: T DIF: 1

9. A consumer prefers more to less of every good. Her income rises, and the price of one of the goods falls while other prices stay constant. These changes must have made her better off.

ANS: T DIF: 1

10. There are 3 goods. The price of good 1 is -1 , the price of good 2 is $+1$, and the price of good 3 is $+2$. It is physically possible for a consumer to consume any commodity bundle with nonnegative amounts of each good. A consumer who has an income of 10 could afford to consume some commodity bundles that include 5 units of good 1 and 6 units of good 2.

ANS: T DIF: 2

11. A decrease in income pivots the budget line around the bundle initially consumed.

ANS: F DIF: 1

MULTIPLE CHOICE

1. If she spends all of her income on breadfruits and melons, Natalie can just afford 9 breadfruits and 10 melons per day. She could also use her entire budget to buy 3 breadfruits and 12 melons per day. The price of breadfruits is 8 yen each. How much is Natalie's income per day?
- 313 yen
 - 317 yen
 - 309 yen
 - 303 yen
 - None of the above.

ANS: E DIF: 1

2. If she spends all of her income on uglifruits and breadfruits, Maria can just afford 11 uglifruits and 4 breadfruits per day. She could also use her entire budget to buy 3 uglifruits and 8 breadfruits per day. The price of uglifruits is 6 pesos each. How much is Maria's income per day?
- 115 pesos
 - 105 pesos
 - 114 pesos
 - 119 pesos
 - None of the above.

ANS: C DIF: 1

3. Harold lives on Doritos and seafood salads. The price of Doritos is 1 dollar per bag and the price of seafood salads is 2 dollars each. Harold allows himself to spend no more than 11 dollars a day on food. He also restricts his consumption to 6,500 calories per day. There are 1,500 calories in a bag of Doritos and 500 calories in a seafood salad. If he spends his entire money budget each day and consumes no more calories than his calorie limit, he can consume up to
- 3 bags of Doritos per day but no more.
 - 1 bag of Doritos per day but no more.
 - 4 seafood salads per day but no more.
 - 4 bags of Doritos per day but no more.
 - None of the above.

ANS: A DIF: 2

4. Quincy lives on pretzels and seafood salads. The price of pretzels is 1 dollar per bag and the price of seafood salads is 2 dollars each. Quincy allows himself to spend no more than 14 dollars a day on food. He also restricts his consumption to 3,400 calories per day. There are 600 calories in a bag of pretzels and 200 calories in a seafood salad. If he spends his entire money budget each day and consumes no more calories than his calorie limit, he can consume up to

- 2 bags of pretzels per day but no more.
- 5 seafood salads per day but no more.
- 4 bags of pretzels per day but no more.
- 5 bags of pretzels per day but no more.
- None of the above.

ANS: C DIF: 2

5. Clara spends her entire budget and consumes 5 units of x and 13 units of y . The price of x is twice the price of y . Her income doubles and the price of y doubles, but the price of x stays the same. If she continues to buy 13 units of y , what is the largest number of units of x that she can afford?
- 10
 - 5
 - 12
 - 14
 - There is not enough information to say.

ANS: A DIF: 1

6. Maria spends her entire budget and consumes 5 units of x and 6 units of y . The price of x is twice the price of y . Her income doubles and the price of y doubles, but the price of x stays the same. If she continues to buy 6 units of y , what is the largest number of units of x that she can afford?
- 12
 - 10
 - 14
 - 5
 - There is not enough information to say.

ANS: B DIF: 1

7. In year 1, the price of good x was \$3, the price of good y was \$2, and income was \$90. In year 2, the price of x was \$9, the price of good y was \$6, and income was \$90. On a graph with x on the horizontal axis and y on the vertical, the new budget line is
- flatter than the old one and lies below it.
 - flatter than the old one and lies above it.
 - steeper than the old one and lies below it.
 - steeper than the old one and lies above it.
 - None of the above.

ANS: E DIF: 1

8. In year 1, the price of good x was \$4, the price of good y was \$1, and income was \$70. In year 2, the price of x was \$9, the price of good y was \$2, and income was \$70. On a graph with x on the horizontal axis and y on the vertical, the new budget line is
- steeper than the old one and lies below it.
 - steeper than the old one and lies above it.
 - flatter than the old one and lies below it.

- d. flatter than the old one and lies above it.
- e. None of the above.

ANS: A DIF: 1

9. If she spends her entire budget, Betsy can afford 74 peaches and 9 pineapples. She can also just afford 14 peaches and 21 pineapples. The price of peaches is 17 cents. What is the price of pineapples in cents?
- a. 95 cents
 - b. 5 cents
 - c. 22 cents
 - d. 85 cents
 - e. None of the above.

ANS: D DIF: 1

10. If she spends her entire budget, Heidi can afford 39 peaches and 12 pears. She can also just afford 24 peaches and 17 pears. The price of peaches is 9 cents. What is the price of pears in cents?
- a. 12 cents
 - b. 37 cents
 - c. 27 cents
 - d. 3 cents
 - e. None of the above.

ANS: C DIF: 1

11. Isabella thrives on two goods: lemons and tangerines. The cost of lemons is 40 guineas each and the cost of tangerines is 20 guineas each. If her income is 320 guineas, how many lemons can she buy if she spends all of her income on lemons?
- a. 6
 - b. 8
 - c. 16
 - d. 11
 - e. None of the above.

ANS: B DIF: 1

12. Georgina thrives on two goods: pears and bananas. The cost of pears is 30 pesos each and the cost of bananas is 15 pesos each. If her income is 180 pesos, how many pears can she buy if she spends all of her income on pears?
- a. 9
 - b. 12
 - c. 4
 - d. 6
 - e. None of the above.

ANS: D DIF: 1

13. Will spends his entire income on 8 sacks of acorns and 8 crates of butternuts. The price of acorns is 9 dollars per sack and his income is 88 dollars. He can just

afford a commodity bundle with A sacks of acorns and B crates of butternuts that satisfies the budget equation

- a. $9A + 4B = 88$.
- b. $18A + 4B = 176$.
- c. $11A + 2B = 88$.
- d. $9A + 6B = 90$.
- e. None of the above.

ANS: B DIF: 1

14. Eduardo spends his entire income on 9 sacks of acorns and 4 crates of butternuts. The price of acorns is 6 dollars per sack and his income is 90 dollars. He can just afford a commodity bundle with A sacks of acorns and B crates of butternuts that satisfies the budget equation
- a. $6A + 13B = 92$.
 - b. $12A + 18B = 180$.
 - c. $8A + 9B = 90$.
 - d. $6A + 11B = 90$.
 - e. None of the above.

ANS: B DIF: 1

15. Harry thrives on two goods, paperback novels and bananas. The cost of paperback novels is 4 dollars each and the cost of bananas is 3 dollars per bunch. If Harry spent all of his income on bananas, he could afford 12 bunches of bananas per week. How many paperback novels could he buy if he spent all of his income on paperback novels?
- a. 36
 - b. 48
 - c. 9
 - d. 16
 - e. None of the above.

ANS: C DIF: 1

16. Suppose that the prices of good x and good y both double and income triples. On a graph where the budget line is drawn with x on the horizontal axis and y on the vertical axis,
- a. the budget line becomes steeper and shifts inward.
 - b. the budget line becomes flatter and shifts outward.
 - c. the budget line becomes flatter and shifts inward.
 - d. the new budget line is parallel to the old budget line and lies below it.
 - e. None of the above.

ANS: E DIF: 1

17. Suppose that the price of good x triples and the price of good y doubles while income remains constant. On a graph where the budget line is drawn with x on the horizontal axis and y on the vertical axis, the new budget line

- a. is flatter than the old one and lies below it.
- b. is flatter than the old one and lies above it.
- c. crosses the old budget line.
- d. is steeper than the old one and lies below it.
- e. is steeper than the old one and lies above it.

ANS: D DIF: 1

18. While traveling abroad, Tammy spent all of the money in her purse to buy 5 plates of spaghetti and 6 oysters. Spaghetti costs 8 units of the local currency per plate and she had 82 units of currency in her purse. If s denotes the number of plates of spaghetti and o denotes the number of oysters purchased, the set of commodity bundles that she could just afford with the money in her purse is described by the equation
- a. $8s + 6o = 82$.
 - b. $6s + 8o = 82$.
 - c. $8s + 7o = 82$.
 - d. $5s + 6o = 82$.
 - e. There is not enough information to determine the answer.

ANS: C DIF: 3

19. Billy Bob wants to gain some weight so that he can play football. Billy consumes only milk shakes and spinach. Milk shakes cost him \$1 each and spinach costs \$2 per serving. A milk shake has 850 calories and a serving of spinach has 200 calories. Billy Bob never spends more than \$20 a day on food and he always consumes at least 8,000 calories per day. Which of the following is necessarily true?
- a. Billy Bob consumes at least 9 milk shakes a day.
 - b. Billy Bob never consumes more than 6 servings of spinach a day.
 - c. Billy Bob never consumes positive amounts of both goods.
 - d. Billy Bob consumes only milk shakes.
 - e. None of the above.

ANS: B DIF: 2

20. Lars consumes only potatoes and herring. When the price of potatoes was 9 crowns per sack and the price of herring was 5 crowns per crock, he spent his entire income to buy 5 sacks of potatoes and 10 crocks of herring per month. Now the government subsidizes potatoes. Market prices haven't changed, but consumers get a subsidy of 5 crowns for every sack of potatoes consumed. To pay for this subsidy, the government introduced an income tax. Lars pays an income tax of 20 crowns per month. If s is the number of sacks of potatoes and c is the number of crocks of herring, what is Lars's new budget equation?
- a. $9s + 5c = 100$.
 - b. $14s + 5c = 95$.

- c. $4s + 5c = 95$.
- d. $4s + 5c = 75$.
- e. $14s + 5c = 120$.

ANS: D DIF: 2

21. If you spent your entire income, you could afford either 3 units of x and 9 units of y or 9 units of x and 3 units of y . If you spent your entire income on x , how many units of x could you buy?
- a. 21
 - b. 16
 - c. 12
 - d. There is not enough information to determine the number of x .
 - e. None of the above.

ANS: C DIF: 1

22. If you spent your entire income, you could afford either 6 units of x and 13 units of y or 13 units of x and 6 units of y . If you spent your entire income on x , how many units of x could you buy?
- a. 19
 - b. 32
 - c. 24
 - d. There is not enough information to determine the number of x .
 - e. None of the above.

ANS: A DIF: 1

23. Bella's budget line for x and y depends on all of the following except
- a. the amount of money she has to spend on x and y .
 - b. the price of x .
 - c. her preferences between x and y .
 - d. the price of y .
 - e. None of the above.

ANS: C DIF: 1

24. Your budget constraint for the two goods A and B is $12A + 4B = I$, where I is your income. You are currently consuming more than 27 units of B . In order to get 3 more units of A , how many units of B would you have to give up?
- a. 0.33
 - b. 0.11
 - c. 3
 - d. 9
 - e. None of the above.

ANS: D DIF: 1

25. Your budget constraint for the two goods A and B is $8A + 4B = I$, where I is your income. You are currently consuming more than 18 units of B . In order to get

3 more units of A , how many units of B would you have to give up?

- 6
- 0.50
- 0.17
- 2
- None of the above.

ANS: A DIF: 1

26. Young Alasdair loves lollipops and hates oatmeal. To induce him to eat enough oatmeal and to restrain him from eating too many lollipops, his mum pays him 10 pence for every quart of oatmeal that he eats. The only way that he can get lollipops is to buy them at the sweet shop, where lollipops cost 5 pence each. Besides what he earns from eating oatmeal, Alasdair gets an allowance of 10 pence per week. If Alasdair consumes only oatmeal and lollipops and if his consumption bundles are graphed with quarts of oatmeal on the horizontal axis and lollipops on the vertical axis, then Alasdair's budget line has a slope

- of 2.
- of less than -2 .
- of -2 .
- of $1/2$.
- greater than 2.

ANS: A DIF: 2

27. The Chuzzlewits have an income of m per week. Let x be food and let y be all other goods. Let p_x be the price of food and p_y be the price of other goods. They can use food stamps to buy food at a price of $p_x(1-s)$ for up to x^* units of food per week. If they buy more food than x^* , they have to pay the full price p_x for additional units. Their weekly income is greater than $p_x(1-s)x^*$. The maximum amount of food that they can buy per week is

- $x^* + (m/p_x)$.
- $(m + x^*)/p_x$.
- $(m/p_x) + sx^*$.
- $m/(1-s)p_x$.
- $(m + p_x)/(1-s)p_x$.

ANS: C DIF: 2

28. Edmund must pay \$6 each for punk rock video cassettes, V . If Edmund is paid \$24 per sack for accepting garbage, G , and if his relatives send him an allowance of \$48, then his budget line is described by the equation

- $6V = 24G$.
- $6V + 24G = 48$.
- $6V - 24G = 48$.
- $6V = 48 - G$.
- None of the above.

ANS: C DIF: 1

29. Edmund must pay \$6 each for punk rock video cassettes, V . If Edmund is paid \$24 per sack for accepting garbage, G , and if his relatives send him an allowance of \$96, then his budget line is described by the equation

- $6V = 24G$.
- $6V + 24G = 96$.
- $6V = 96 - G$.
- $6V - 24G = 96$.
- None of the above.

ANS: D DIF: 1

30. If you have an income of \$40 to spend, commodity 1 costs \$4 per unit, and commodity 2 costs \$8 per unit, then the equation for your budget line can be written

- $x_1/4 + x_2/8 = 40$.
- $(x_1 + x_2)/12 = 40$.
- $x_1 + 2x_2 = 10$.
- $5x_1 + 9x_2 = 41$.
- $12(x_1 + x_2) = 40$.

ANS: C DIF: 1

31. If you have an income of \$40 to spend, commodity 1 costs \$2 per unit, and commodity 2 costs \$10 per unit, then the equation for your budget line can be written

- $x_1 + 5x_2 = 20$.
- $x_1/2 + x_2/10 = 40$.
- $(x_1 + x_2)/12 = 40$.
- $3x_1 + 11x_2 = 41$.
- $12(x_1 + x_2) = 40$.

ANS: A DIF: 1

32. If you could exactly afford either 4 units of x and 24 units of y , or 9 units of x and 4 units of y , then if you spent all of your income on y , how many units of y could you buy?

- 40
- 20
- 60
- 13
- None of the above.

ANS: A DIF: 1

33. If you could exactly afford either 5 units of x and 21 units of y , or 9 units of x and 5 units of y , then if you spent all of your income on y , how many units of y could you buy?

- 57
- 14
- 25
- 41
- None of the above.

ANS: D DIF: 1

34. Murphy used to consume 100 units of X and 50 units of Y when the price of X was \$2 and the price of Y was \$4. If the price of X rose to \$4 and the price of Y rose to \$9, how much would Murphy's income have to rise so that he could still afford his original bundle?
- \$700
 - \$450
 - \$350
 - \$1,050
 - None of the above.

ANS: B DIF: 1

35. Murphy used to consume 100 units of X and 50 units of Y when the price of X was \$2 and the price of Y was \$4. If the price of X rose to \$3 and the price of Y rose to \$8, how much would Murphy's income have to rise so that he could still afford his original bundle?
- \$750
 - \$250
 - \$300
 - \$500
 - None of the above.

ANS: C DIF: 1

36. This weekend, Martha has time to read 40 pages of economics and 30 pages of sociology. Alternatively, she could read 30 pages of economics and 50 pages of sociology. Which of these equations describes all combinations of pages of economics, E , and sociology, S , that she could read over the weekend?
- $E + S = 70$.
 - $E/2 + S = 50$.
 - $2E + S = 110$.
 - $E + S = 80$.
 - All of the above.

ANS: C DIF: 1

37. This weekend, Martha has time to read 40 pages of economics and 30 pages of sociology. Alternatively, she could read 10 pages of economics and 90 pages of sociology. Which of these equations describes all combinations of pages of economics, E , and sociology, S , that she could read over the weekend?
- $E/2 + S = 50$.
 - $E + S = 100$.
 - $E + S = 70$.
 - $2E + S = 110$.
 - All of the above.

ANS: D DIF: 2

38. Ads in a slick business magazine are read by 300 lawyers and 1,000 M.B.A.s. Ads in a consumer publication are read by 250 lawyers and 300 M.B.A.s. If Harry had \$3,000 to spend on advertising, the price of ads in the

business magazine were \$500, and the price of ads in the consumer magazine were \$250, then the combinations of M.B.A.s and lawyers whom he could reach with his advertising budget would be represented by the integer values along a line segment that runs between the two points

- (3, 000, 3, 600) and (1, 800, 6, 000).
- (3, 600, 4, 200) and (1, 800, 7, 200).
- (0, 3, 600) and (1, 800, 0).
- (3, 600, 0) and (0, 7, 200).
- (2, 400, 0) and (0, 6, 000).

ANS: A DIF: 2

39. Ads in a slick business magazine are read by 300 lawyers and 1,000 M.B.A.s. Ads in a consumer publication are read by 250 lawyers and 300 M.B.A.s. If Harry had \$3,750 to spend on advertising, the price of ads in the business magazine were \$500, and the price of ads in the consumer magazine were \$250, then the combinations of M.B.A.s and lawyers whom he could reach with his advertising budget would be represented by the integer values along a line segment that runs between the two points
- (4, 500, 0) and (0, 9, 000).
 - (3, 750, 4, 500) and (2, 250, 7, 500).
 - (0, 4, 500) and (2, 250, 0).
 - (4, 500, 5, 250) and (2, 250, 9, 000).
 - (3, 000, 0) and (0, 7, 500).

ANS: B DIF: 2

40. In the economy of Mungo, discussed in your workbook, there is a third person called Ike. Ike has a red income of 92 rcus and a blue income of 20 bcus. (Recall that red prices are 2 rcus [red currency units] per unit of ambrosia and 6 rcus per unit of bubble gum. Blue prices are 1 bcu [blue currency unit] per unit of ambrosia and 1 bcu per unit of bubble gum. You have to pay twice for what you buy, once in red currency and once in blue currency.) If Ike spends all of his blue income but not all of his red income, then he consumes
- at least 13 units of bubble gum.
 - at least 7 units of ambrosia.
 - exactly twice as much bubble gum as ambrosia.
 - at least 17 units of bubble gum.
 - equal amounts of ambrosia and bubble gum.

ANS: D DIF: 2

41. In the economy of Mungo, discussed in your workbook, there is a third person called Ike. Ike has a red income of 94 rcus and a blue income of 25 bcus. (Recall that red prices are 2 rcus [red currency units] per unit of ambrosia and 6 rcus per unit of bubble gum. Blue prices are 1 bcu [blue currency unit] per unit of ambrosia and 1 bcu per unit of bubble gum. You have

- to pay twice for what you buy, once in red currency and once in blue currency.) If Ike spends all of his blue income but not all of his red income, then he consumes
- at least 14 units of ambrosia.
 - at least 11 units of bubble gum.
 - exactly twice as much bubble gum as ambrosia.
 - at least 15 units of bubble gum.
 - equal amounts of ambrosia and bubble gum.

ANS: A DIF: 2

42. Deadly Serious, II, studying for his M.B.A., consumes only two goods, Wheaties and pens. Each pen costs \$1. Each box of Wheaties costs \$2 but has a free pen inside. Pens can be discarded at no cost. If we draw Serious's budget set with pens plotted on the horizontal axis, then his budget set will be bounded by two line segments with slopes
- zero and -1 .
 - zero and -2 .
 - zero and -0.5 .
 - zero and infinity.
 - zero and $+2$.

ANS: A DIF: 2

43. Suppose there are two goods, the prices of both goods are positive, and a consumer's income is also positive. If the consumer's income doubles and the price of both goods triple,
- the consumer's budget line gets steeper and shifts inward.
 - the slope of the consumer's budget line does not change but the budget line shifts outward away from the origin.
 - the consumer's budget line gets steeper and shifts outward.
 - the slope of the consumer's budget line does not change but the budget line shifts inward toward the origin.
 - the consumer's budget line gets flatter and shifts inward.

ANS: D DIF: 2

44. Thomas consumes coffee (C) and doughnuts (D). His budget line was described by the equation $D = 20 - 2C$. At a later time, his budget line could be described by the equation $D = 10 - C$. The change between the earlier budget line and the later could be explained by the fact that
- the price of coffee and Thomas's income both increased.
 - the price of coffee increased and Thomas's income decreased.
 - the price of coffee decreased and Thomas's income increased.

- the price of coffee and Thomas's income both decreased.
- Thomas's utility for doughnuts decreased.

ANS: B DIF: 2

PROBLEMS

1. Perry lives on avocados and beans. The price of avocados is \$10, the price of beans is \$5, and his income is \$40. Show Perry's budget line on a graph with avocados on the horizontal axis and beans on the vertical axis. Label the point where the budget line hits the horizontal axis A and the point where the budget line hits the vertical axis B . Next to these labels, write down the number of avocados purchased at A and the number of beans purchased at B . Draw another budget line showing what Perry's budget would be if his income doubled, the price of avocados doubled, and the price of beans stayed the same. Label the point where this line hits the vertical axis C and the point where it hits the horizontal axis D . Next to these labels write the number of avocados at C and the number of beans at D .

ANS:

At A there are 4 avocados and at B there are 8 units of beans. At C there are 4 avocados and at D there are 16 units of beans.

DIF: 1

2. Brenda likes hot dogs and Coca-Cola. Hot dogs cost \$1 each and Cokes cost \$.50 per bottle. There is a special promotion for Coke that will last for one month. If Brenda sends in the bottle tops from the Cokes she drinks during the next month, she will get a refund of \$.20 for every bottlecap beyond the first 12 that she returns. For example, if she returns 25 bottle caps she will get back $\$2.60 = \$.20(25 - 12)$. Brenda has \$40 to spend on hot dogs and Coke during the next month. Draw her budget line with Coke on the horizontal axis and hot dogs on the vertical axis. Find the points where the budget line hits the axes and the point where it has a kink. At each of these three points write down the quantities of each good consumed.

ANS:

The budget line runs from $(0, 40)$ on the vertical axis to a kink point $(12, 34)$ and from $(12, 34)$ to about $(125.3, 0)$.

DIF: 2

3. Felicity is studying economics and political science. She can read 30 pages of political science per hour but only 5 pages of economics per hour. This week she has

a 50-page assignment in economics and a 150-page assignment in political science. Because of sorority rush, she cannot devote more than 10 hours to studying these subjects this week. She realizes she cannot complete all of her assignments but is determined to complete at least 30 pages of her economics reading. Draw a graph with pages of economics on the horizontal axis and pages of political science on the vertical axis. On this graph, show the possibilities that are consistent with the constraints that Felicity has imposed on herself. (She is allowed to read ahead in either subject.) Label key points on your graph with their numerical values.

ANS:

Anything in the triangle bounded by $(0, 300)$, $(30, 120)$, and $(30, 0)$ satisfies these constraints.

DIF: 2

4. Ed Moore and his family live in a city with many private schools and one public school. The Moores are

thinking of sending their only child to private school because they would like a school that has more teachers and other resources per student than the local public school. The Moores must pay taxes to support local public schools whether or not their child goes to private school. There is such a variety of private schools that the Moores can get just about any level of inputs per student by choosing the appropriate private school. Tuition in the private schools equals expenditure per student. Draw a diagram to show the Moores' budget constraint. Put expenditures per student in the child's school on the horizontal axis and other goods on the vertical.

ANS:

One point is (x, d) , where x is expenditures per pupil in public school and d is disposable income. The rest of the budget is a line with slope -1 from $(2s, d-x)$ to the x axis.

DIF: 3

CHAPTER 3

Preferences

TRUE/FALSE

1. If preferences are transitive, more is always preferred to less.
ANS: F DIF: 1
2. A person with reflexive preferences is someone who does not shop carefully.
ANS: F DIF: 1
3. If someone has the utility function $U = 1,000 + 2 \min\{x, y\}$, then x and y are perfect complements for that person.
ANS: T DIF: 2
4. A consumer with convex preferences who is indifferent between the bundles (5, 2) and (11, 6) will like the bundle (8, 4) at least as well as either of the first two bundles.
ANS: F DIF: 1
5. A consumer with convex preferences who is indifferent between the bundles (5, 1) and (11, 3) will like the bundle (8, 2) at least as well as either of the first two bundles.
ANS: F DIF: 1
6. If there are two goods, if a consumer prefers more of each good to less, and if she has a diminishing marginal rate of substitution, then her preferences are convex.
ANS: T DIF: 2
7. If preferences are convex, then for any commodity bundle x , the set of commodity bundles that are worse than x is a convex set.
ANS: F DIF: 2
8. Bill Katz prefers more of good 1 to less and he prefers less of good 2 to more. Bill has convex preferences. If we draw his indifference curves with good 1 on the horizontal axis and good 2 on the vertical axis, then his indifference curves have positive slope but get steeper as they rise.
ANS: F DIF: 2
9. The marginal rate of substitution measures the distance between one indifference curve and the next one.
ANS: F DIF: 1
10. Ambrose has an indifference curve with equation $x_2 = 20 - 4x_1^{1/2}$. When Ambrose is consuming the bundle (4, 16), his marginal rate of substitution is 25/4.
ANS: F DIF: 1
11. Nancy's psychology teacher will give her a course grade that is the maximum of her scores on three midterm examinations. Nancy has convex preferences over the possible combinations of midterm scores.
ANS: F DIF: 1
12. If Melody has more classical records than rock and roll records, she is willing to exchange exactly 1 classical record for 2 rock and roll records, but if she has more rock and roll records than classical records, then she is willing to exchange exactly 1 rock and roll record for 2 classical records. Melody has convex preferences.
ANS: F DIF: 3
13. Josephine buys 3 quarts of milk and 2 pounds of butter when milk sells for \$2 a quart and butter sells for \$1 a pound. Wilma buys 2 quarts of milk and 3 pounds of butter at the same prices. Josephine's marginal rate of

substitution between milk and butter is greater than Wilma's.

ANS: F DIF: 1

14. A consumer who is unable to detect small differences in the amount of water in her beer could have a transitive strict preference relation but is unlikely to have a transitive indifference relation.

ANS: T DIF: 2

MULTIPLE CHOICE

1. Colette consumes goods x and y . Her indifference curves are described by the formula $y = k/(x + 7)$. Higher values of k correspond to better indifference curves.
- Colette likes good y and hates good x .
 - Colette prefers bundle (12, 16) to bundle (16, 12).
 - Colette prefers bundle (8, 5) to bundle (5, 8).
 - Colette likes good x and hates good y .
 - More than one of the above statements are true.

ANS: B DIF: 1

2. Angela consumes goods x and y . Her indifference curves are described by the formula $y = k/(x + 3)$. Higher values of k correspond to better indifference curves.
- Angela prefers bundle (8, 9) to bundle (9, 8).
 - Angela likes good y and hates good x .
 - Angela prefers bundle (11, 9) to bundle (9, 11).
 - Angela likes good x and hates good y .
 - More than one of the above statements are true.

ANS: A DIF: 1

3. Nick's indifference curves are circles, all of which are centered at (12, 12). Of any two indifference circles, he would rather be on the inner one than the outer one.
- Nick's preferences are not complete.
 - Nick prefers (16, 17) to (10, 10).
 - Nick prefers (10, 17) to (10, 10).
 - Nick prefers (8, 8) to (17, 21).
 - More than one of the above statements are true.

ANS: D DIF: 1

4. Steven's indifference curves are circles, all of which are centered at (15, 13). Of any two indifference circles, he would rather be on the inner one than the outer one.
- Steven prefers (19, 22) to (13, 7).
 - Steven prefers (13, 22) to (13, 7).
 - Steven prefers (12, 10) to (22, 18).

- Steven's preferences are not complete.
- More than one of the above statements are true.

ANS: C DIF: 1

5. Tim consumes only apples and bananas. He prefers more apples to fewer, but he gets tired of bananas. If he consumes fewer than 29 bananas per week, he thinks that 1 banana is a perfect substitute for 1 apple. But you would have to pay him 1 apple for each banana beyond 29 that he consumes. The indifference curve that passes through the consumption bundle with 30 apples and 39 bananas also passes through the bundle with A apples and 21 bananas, where A equals
- 25.
 - 28.
 - 34.
 - 36.
 - None of the above.

ANS: B DIF: 1

6. Leo consumes only apples and bananas. He prefers more apples to fewer, but he gets tired of bananas. If he consumes fewer than 24 bananas per week, he thinks that 1 banana is a perfect substitute for 1 apple. But you would have to pay him 1 apple for each banana beyond 24 that he consumes. The indifference curve that passes through the consumption bundle with 31 apples and 36 bananas also passes through the bundle with A apples and 18 bananas, where A equals
- 29.
 - 23.
 - 31.
 - 25.
 - None of the above.

ANS: D DIF: 1

7. If two goods are both desirable and preferences are convex, then
- there must be a kink in the indifference curves.
 - indifference curves must be straight lines.
 - if two bundles are indifferent, then an average of the two bundles is worse than either one.
 - the marginal rate of substitution is constant along indifference curves.
 - None of the above.

ANS: E DIF: 1

8. If there are only two goods, if more of good 1 is always preferred to less, and if less of good 2 is always preferred to more, then indifference curves
- slope downward.
 - slope upward.
 - may cross.

- d. could take the form of ellipses.
- e. None of the above.

ANS: B DIF: 2

9. If two goods are perfect complements,
- a. there is a bliss point and the indifference curves surround this point.
 - b. consumers will only buy the cheaper of the two goods.
 - c. indifference curves have a positive slope.
 - d. None of the above.

ANS: D DIF: 2

10. The relation “is preferred to” between commodity bundles is just one example of a binary relation. Another example is the relation “is a full brother of” defined over the set of all human beings. Let xRy mean person x is a full brother of person y .
- a. The relation R is reflexive, transitive, and complete.
 - b. The relation R is transitive and complete but not reflexive.
 - c. The relation R is transitive but not complete or reflexive.
 - d. The relation R is complete but not transitive or reflexive.
 - e. The relation R is not reflexive, transitive, or complete.

ANS: C DIF: 2

11. Preferences are said to be monotonic if
- a. all goods must be consumed in fixed proportions.
 - b. all goods are perfect substitutes.
 - c. more is always preferred to less.
 - d. there is a diminishing marginal rate of substitution.
 - e. None of the above.

ANS: C DIF: 1

12. Toby Talkalot subscribes to a local phone service that charges a fixed fee of \$10 per month and allows him to place as many local phone calls as he likes without further charge. Let good 1 be an aggregate of commodities other than local phone use and let good 2 be local phone use. (Measure good 1 on the horizontal axis and good 2 on the vertical axis.) On Monday, Toby didn't use the telephone at all. The slope m of his indifference curve at the consumption bundle he chose on Monday was
- a. positive.
 - b. less than or equal to 0.
 - c. 0.
 - d. greater than or equal to 0.
 - e. negative.

ANS: C DIF: 3

13. Professor Goodheart's colleague Dr. Kremepuff gives 3 midterm exams. He drops the lowest score and gives each student her average score on the other two exams. Polly Sigh is taking his course and has a 60 on her first exam. Let x_2 be her score on the second exam and x_3 be her score on the third exam. If we draw her indifference curves for scores on the second and third exams with x_2 represented by the horizontal axis and x_3 represented by the vertical axis, then her indifference curve through the point $(x_2, x_3) = (50, 70)$ is
- a. L-shaped with a kink where $x_2 = x_3$.
 - b. three line segments, one vertical, one horizontal, and one running from $(70, 60)$ to $(60, 70)$.
 - c. a straight line, running from $(0, 120)$ to $(120, 0)$.
 - d. three line segments, one vertical, one horizontal, and one running from $(70, 50)$ to $(50, 70)$.
 - e. a V-shaped curve with its point at $(50, 70)$.

ANS: B DIF: 3

14. Charlie's indifference curves have the equation $x_B = \text{constant}/x_A$, where larger constants denote better indifference curves. Charlie strictly prefers the bundle $(6, 16)$ to
- a. the bundle $(16, 6)$.
 - b. the bundle $(7, 15)$.
 - c. the bundle $(10, 11)$.
 - d. more than one of these bundles.
 - e. none of these bundles.

ANS: E

15. Charlie's indifference curves have the equation $x_B = \text{constant}/x_A$ where larger constants denote better indifference curves. Charlie strictly prefers the bundle $(10, 17)$ to
- a. the bundle $(11, 16)$.
 - b. the bundle $(17, 10)$.
 - c. the bundle $(12, 15)$.
 - d. more than one of these bundles.
 - e. none of these bundles.

ANS: E

16. Ambrose has indifference curves with the equation $x_2 = \text{constant} - 4x_1^{1/2}$, where larger constants correspond to higher indifference curves. If good 1 is drawn on the horizontal axis and good 2 on the vertical axis, what is the slope of Ambrose's indifference curve when his consumption bundle is $(16, 17)$?
- a. $-16/17$
 - b. $-17/16$
 - c. -0.50
 - d. -21
 - e. -4

ANS: C DIF: 2

17. Ambrose has indifference curves with the equation $x_2 = \text{constant} - 4x_1^{1/2}$, where larger constants correspond to higher indifference curves. If good 1 is drawn on the horizontal axis and good 2 on the vertical axis, what is the slope of Ambrose's indifference curve when his consumption bundle is (9, 5)?
- 0.67
 - 8
 - 9/5
 - 5/9
 - 3

ANS: A DIF: 2

18. Nancy Lerner is taking a course from Professor Goodheart who will count only her best midterm grade and from Professor Stern who will count only her worst midterm grade. In one of her classes, Nancy has scores of 30 on her first midterm and 50 on her second midterm. When the first midterm score is measured on the horizontal axis and her second midterm score on the vertical, her indifference curve has a slope of zero at the point (30, 50). Therefore this class could
- be Professor Goodheart's but could not be Professor Stern's.
 - be Professor Stern's but could not be Professor Goodheart's.
 - not be either Professor Goodheart's or Professor Stern's.
 - be either Professor Goodheart's or Professor Stern's.
 - None of the above.

ANS: A DIF: 2

19. Nancy Lerner is taking a course from Professor Goodheart who will count only her best midterm grade and from Professor Stern who will count only her worst midterm grade. In one of her classes, Nancy has scores of 20 on her first midterm and 70 on her second midterm. When the first midterm score is measured on the horizontal axis and her second midterm score on the vertical, her indifference curve has a slope of zero at the point (20, 70). Therefore this class could
- be Professor Goodheart's but could not be Professor Stern's.
 - not be either Professor Goodheart's or Professor Stern's.
 - be either Professor Goodheart's or Professor Stern's.
 - be Professor Stern's but could not be Professor Goodheart's.
 - None of the above.

ANS: A DIF: 2

20. If we graph Mary Granola's indifference curves with avocados on the horizontal axis and grapefruits on the vertical axis, then whenever she has more grapefruits

than avocados, the slope of her indifference curve is 22. Whenever she has more avocados than grapefruits, the slope is 21/2. Mary would be indifferent between a bundle with 22 avocados and 37 grapefruits and another bundle that has 37 avocados and

- 27 grapefruits.
- 32 grapefruits.
- 17 grapefruits.
- 22 grapefruits.
- 24.5 grapefruits.

ANS: D DIF: 2

21. If we graph Mary Granola's indifference curves with avocados on the horizontal axis and grapefruits on the vertical axis, then whenever she has more grapefruits than avocados, the slope of her indifference curve is 22. Whenever she has more avocados than grapefruits, the slope is 21/2. Mary would be indifferent between a bundle with 14 avocados and 20 grapefruits and another bundle that has 26 avocados and
- 11 grapefruits.
 - 18 grapefruits.
 - 6 grapefruits.
 - 16 grapefruits.
 - 13.5 grapefruits.

ANS: A DIF: 2

22. Recall that Tommy Twit's mother measures the departure of any bundle from her favorite bundle for Tommy by the sum of the absolute values of the differences. Her favorite bundle for Tommy is (2, 7), that is, 2 cookies and 7 glasses of milk. Tommy's mother's indifference curve that passes through the point $(c, m) = (4, 5)$ also passes through
- the point (6, 3).
 - the points (2, 3), (6, 7), and (4, 9).
 - the point (2, 7).
 - the points (4, 7), (2, 5), and (2, 9).
 - None of the above.

ANS: B DIF: 2

23. Recall that Tommy Twit's mother measures the departure of any bundle from her favorite bundle for Tommy by the sum of the absolute values of the differences. Her favorite bundle for Tommy is (2, 7), that is, 2 cookies and 7 glasses of milk. Tommy's mother's indifference curve that passes through the point $(c, m) = (5, 4)$ also passes through
- the points (5, 7), (2, 4), and (2, 10).
 - the points (2, 1), (8, 7), and (5, 10).
 - the point (8, 1).
 - the point (2, 7).
 - None of the above.

ANS: B DIF: 2

24. Scholastica is taking a class from Professor Chaos. Professor Chaos gives two tests in this course and determines a student's grade as follows. He determines the smaller of the following two numbers: half of the score on the first test (which is a relatively easy test) and the total score on the second test. He gives each student a numerical score equal to the smaller number and then ranks the students. Scholastica would like to be ranked as high as possible in Professor Chaos's rankings. If we represent her score on the first exam on the horizontal axis and her score on the second exam on the vertical axis, then her indifference curves
- are L-shaped with kinks where the two exam scores are equal.
 - have sections with a slope 22 and sections with a slope $1/2$.
 - are positively sloped.
 - are L-shaped with kinks where the exam 1 score is twice the exam 2 score.
 - are straight lines with a slope of $21/2$.

ANS: D DIF: 2

25. In Professor Meanscore's class, the first midterm exam and the second midterm exam are weighted equally toward the final grade. With the first midterm's score on the horizontal axis, and the second midterm's score on the vertical axis, indifference curves between the two exam scores are
- L-shaped with lines extending upward and to the right.
 - L-shaped with lines extending downward and to the left.
 - parabola shaped.
 - straight lines with slope 21.
 - straight lines with slope 2.

ANS: D DIF: 2

26. Professor Stern's colleague, Dr. Schmertz, gives one midterm exam and a final exam. He weights the final twice as heavily as the midterm to determine the course grade. No grades can be dropped. If the midterm score is represented on the horizontal axis and the final score on the vertical axis, and if a student in Dr. Schmertz's class cares only about her course grade, her indifference curve is
- a line with slope 22.
 - a line with slope 21.
 - a line with slope 20.5.
 - L-shaped with the kink at $(x, 2x)$.
 - L-shaped with the kink at $(2x, x)$.

ANS: C DIF: 2

27. I prefer 6 apples and 1 orange to 5 apples and 2 oranges. My preferences

- are transitive.
- are complete.
- are convex.
- obey the Law of Demand.
- None of the above.

ANS: E DIF: 2

PROBLEMS

1. Draw graphs with quantities of pepperoni pizza on the horizontal axis and quantities of anchovy pizza on the vertical axis to illustrate the following situations. In each case draw two different indifference curves and make a little arrow pointing in the direction of greater preference.
- Marvin loves pepperoni pizza and hates anchovy pizza.
 - Mavis hates anchovy pizza and is completely indifferent about pepperoni pizza.

ANS:

- Indifference curves slope up and to the right. Arrow points down and to the left.
- Indifference curves are horizontal lines. Arrow points down.

DIF: 3

2. Coach Steroid likes his players to be big, fast, and obedient. If player *A* is better than player *B* in two of these three characteristics, Steroid will prefer *A* to *B*. Three players try out for quarterback. Wilbur Westinghouse weighs 320 pounds, runs very slowly, and is quite obedient. Harold Hotpoint weighs 240 pounds, runs extremely fast, and is extremely disobedient. Jerry Jacuzzi weighs 150 pounds, runs at average speed, and is extremely obedient. Does Coach Steroid have transitive preferences? Explain your answer.

ANS:

No. Steroid prefers *W* to *H* because *W* is heavier and more obedient. He prefers *H* to *J* because *H* is heavier and faster. But he prefers *J* to *W* because *J* is more obedient and faster than *W*. Since his preferences have a cycle, they cannot be transitive.

DIF: 3

3. Belinda loves chocolate and always thinks that more is better than less. Belinda thinks that a few piano lessons would be worse than none at all, but if she had enough piano lessons to get good at playing the piano, she would prefer more lessons to less. Draw a graph with piano lessons on the horizontal axis and chocolate on the vertical axis. On your graph sketch two

indifference curves for Belinda that would be consistent with this story. Label the better of the two indifference curves AA and the worse one BB .

ANS:

The indifference curves would look something like inverted U 's. (The area under these curves needn't be necessarily convex.) The better of the two curves drawn is the higher one.

DIF: 3

4. Mac Rowe doesn't sweat the petty stuff. In fact, he just cannot detect small differences. He consumes two goods, x and y . He prefers the bundle (x,y) to the bundle (x', y') if and only if $(xy - x'y' > 1)$. Otherwise he is indifferent between the two bundles.
- Show that the relation of indifference is not transitive for Mac. (Hint: Give an example.)
 - Show that the preferred relation is transitive for Mac.

ANS:

- Consider the bundles $A = (1, 1)$, $B = (1, 1.75)$, and $C = (1, 2.5)$. Then A is indifferent to B and B to C , but C is preferred to A .
- To see that strict preference is transitive, suppose we have any three bundles, (x, y) , (x', y') and (x'', y'') . If the first is preferred to the second and the second to the third, then $xy - x'y' > 1$ and $x'y' - x''y'' > 1$. Simple algebra shows that $xy - x''y'' > 1$. Therefore the first must be preferred to the third.

DIF: 3

5. Blanche Carter has devised a system for rating the males in her economics class. She cares about their intelligence and their looks. She has ranked each male on a scale of 1 to 5 for intelligence and 1 to 3 for looks. She defines a preference relation, R , as follows: xRy if boy x scores at least as high as boy y in either looks or intelligence. Give an example to show that Blanche's method of determining preferences might not lead to transitive preferences.

ANS:

Suppose boy x has rankings 1 and 2, boy y has rankings 3 and 1, and boy z has rankings 2 and 3. Then xRy because x is better looking than y and yRz because y is

smarter than z . But it is not true that xRz . In fact z is both smarter and better looking than x .

DIF: 3

6. Explain how it would be possible to cheat someone who had intransitive preferences. Be explicit about what you would offer him if you were trying to exploit his intransitivity and what he would do in response.

ANS:

Suppose that he has bundle C right now and prefers A to B , B to C , and C to A . If you offer him a trade that leaves him at B instead of C , he will accept the deal. If you now offer him a trade that leaves him at A instead of B , he will accept that. But he will prefer to be back where he originally was to where he is. So you could offer to give him back his original bundle, minus a reward to you for your efforts, and he would accept the deal.

DIF: 2

7. If good X is measured on the horizontal axis and good Y on the vertical, what can you say about the preferences of someone whose indifference curves are
- parallel to the Y axis?
 - positively sloped with more desirable indifference curves as one moves to the right?
 - negatively sloped with more desirable indifference curves as one moves to the left?

ANS:

- This person doesn't care how much X he has.
- This person likes X but hates Y .
- This person hates both goods.

DIF: 1

8. Suppose that there are two commodities and a consumer prefers more to less of each good. If the consumer has transitive preferences, can her indifference curves cross? Sketch a brief proof of your answer, and illustrate with a diagram.

ANS:

See the textbook.

DIF: 2

CHAPTER 4

Utility

TRUE/FALSE

1. With quasilinear preferences, the slope of indifference curves is constant along all rays through the origin.
ANS: F DIF: 2
2. Wanda Lott has the utility function $U(x, y) = \max\{x, y\}$. Wanda's preferences are convex.
ANS: F DIF: 2
3. If someone has a utility function $U = 2 \min\{x, y\}$, then x and y are perfect complements for that person.
ANS: T DIF: 1
4. Maximilian consumes two goods, x and y . His utility function is $U(x, y) = \max\{x, y\}$. Therefore x and y are perfect substitutes for Max.
ANS: F DIF: 1
5. A person with the utility function $U(x, y) = y + x^2$ has convex preferences.
ANS: F DIF: 3
6. Mr. Surly consumes only two goods and hates them both. His utility function is $U(x, y) = 2\max\{x, y\}$. Mr. Surly has (*weakly*) convex preferences.
ANS: T DIF: 3
7. Angela's utility function is $U(x_1, x_2) = (x_1 + x_2)^3$. Her indifference curves are downward-sloping, parallel straight lines.
ANS: T DIF: 2
8. Henrietta's utility function is $U(x_1, x_2) = x_1 x_2$. She has diminishing marginal rate of substitution between goods 1 and 2.
ANS: T DIF: 2
9. Alice's utility function is $U(x, y) = x^2 y$. Steve's utility function is $U(x, y) = x^2 y + 2x$. Alice and Steve have the same preferences since Steve's utility function is a monotonic transformation of Alice's.
ANS: F DIF: 2
10. Jeans utility function is $U(x, y) = x + y^2 - y$. If we draw her indifference curves with x on the horizontal axis and y on the vertical axis, then these indifference curves are everywhere downward sloping and get flatter as one moves from left to right.
ANS: F DIF: 3
11. The utility function $U(x_1, x_2) = 2\ln x_1 + 3\ln x_2$ represents Cobb-Douglas preferences.
ANS: T DIF: 1
12. Fiery Demon is a rotgut whisky made in Kentucky. Smoothy is an unblended malt whisky imported from Scotland. Ed regards these brands as perfect substitutes. When he goes into a bar, he sometimes buys only Fiery Demon. Other times he buys only Smoothy. This shows that Ed has unstable preferences.
ANS: F DIF: 1
13. Mark strictly prefers consumption bundle A to consumption bundle B and weakly prefers bundle B to bundle A . These preferences can be represented by a utility function.
ANS: F DIF: 1

14. A consumer has preferences represented by the utility function $U(x_1, x_2) = 10(x_1^2 + 2x_1x_2 + x_2^2) - 50$. For this consumer, goods 1 and 2 are perfect substitutes.

ANS: T DIF: 3

15. A person with utility function $U(x, y) = 5 + y^2 + 2x$ has nonconvex preferences.

ANS: T DIF: 1

16. A person with the utility function $U(x, y) = 10 + y^2 + x$ has convex preferences.

ANS: T DIF: 2

17. A person with the utility function $U(x_1, x_2) = \min\{x_1 + 2x_2, 2x_1 + x_2\}$ has convex but not strictly convex preferences.

ANS: F DIF: 2

18. If one utility function is a monotonic transformation of another, then the former must assign a higher utility number to every bundle than the latter.

ANS: F DIF: 2

19. Quasilinear preferences are homothetic when the optimal amount of good 1 is not affordable.

ANS: F DIF: 2

MULTIPLE CHOICE

1. Ike's utility function is $U(x, y) = 25xy$. He has 12 units of good x and 8 units of good y . Ben's utility function for the same two goods is $U(x, y) = 4x + 4y$. Ben has 9 units of x and 13 units of y .
- Ike prefers Ben's bundle to his own bundle, but Ben prefers his own bundle to Ike's.
 - Ben prefers Ike's bundle to his own, but Ike prefers his own bundle to Ben's.
 - Each prefers the other's bundle to his own.
 - Neither prefers the other's bundle to his own.
 - Since they have different preferences, there is not enough information to determine who envies whom.

ANS: A DIF: 2

2. Ernie's utility function is $U(x, y) = 32xy$. He has 10 units of good x and 8 units of good y . Waldo's utility function for the same two goods is $U(x, y) = 3x + 5y$. Waldo has 9 units of x and 13 units of y .
- Waldo prefers Ernie's bundle to his own, but Ernie prefers his own bundle to Waldo's.
 - Each prefers the other's bundle to his own.
 - Neither prefers the other's bundle to his own.
 - Ernie prefers Waldo's bundle to his own bundle, but Waldo prefers his own bundle to Ernie's.

- e. Since they have different preferences, there is not enough information to determine who envies whom.

ANS: D DIF: 2

3. Tim has preferences represented by the utility function $U(x, y) = \min\{6x + y, x + 2y\}$. If x is on the horizontal axis and y is on the vertical axis, what is the slope of his indifference curve at the point $(8, 9)$?

- 6
- 2/6
- 1/2
- 1/6
- 8/9

ANS: C DIF: 2

4. Jean-Pierre has preferences represented by the utility function $U(x, y) = \min\{2x + y, x + 6y\}$. If x is on the horizontal axis and y is on the vertical axis, what is the slope of his indifference curve at the point $(7, 7)$?

- 1/2
- 6/2
- 1/6
- 2
- 7/7

ANS: D DIF: 2

5. Doreen has preferences represented by the utility function $U(x, y) = 10x + 5y$. She consumes 10 units of good x and 9 units of good y . If her consumption of good x is lowered to 1, how many units of y must she have in order to be exactly as well off as before?

- 20
- 30
- 27
- 18
- None of the above.

ANS: C DIF: 1

6. Angela has preferences represented by the utility function $U(x, y) = 2x + 2y$. She consumes 10 units of good x and 6 units of good y . If her consumption of good x is lowered to 4, how many units of y must she have in order to be exactly as well off as before?

- 14
- 13
- 12
- 15
- None of the above.

ANS: C DIF: 1

7. Mac's utility function is $U(x, y) = \max\{2x - y, 2y - x\}$.
- Mac's preferences are quasilinear.
 - If Mac has more x than y , any increase in his consumption of y would lower his utility.

- c. If Mac has more x than y , a decrease in his consumption of y would raise his utility.
- d. Mac always prefers more of each good to less.
- e. Goods x and y are perfect substitutes.

ANS: B DIF: 3

8. Charles's utility function is $U(x, y) = xy$. Anne's utility function is $U(x, y) = 1,000xy$. Diana's utility function is $-xy$. Elizabeth's utility function is $U(x, y) = -1/(xy + 1)$. Fergie's utility function is $xy - 10,000$. Margaret's utility function is x/y . Philip's utility function is $x/(y + 1)$. (The goods x and y are two very expensive goods. We leave you to speculate about what they are.) Which of these persons have the same preferences as Charles?
- a. Everybody except Diana
 - b. Anne and Fergie
 - c. Anne, Fergie, and Elizabeth
 - d. None of them
 - e. All of them

ANS: C DIF: 2

9. Raymond's preferences are represented by the utility function $U(x, y) = x/y$ if $y > 0$ and $U(x, y) = 0$ if $y = 0$.
- a. Raymond has indifference curves that are rectangular hyperbolas.
 - b. Raymond prefers more of each good to less.
 - c. Raymond has quasilinear preferences.
 - d. Raymond has a bliss point.
 - e. Raymond has indifference curves that are upward-sloping straight lines if $y > 0$.

ANS: E DIF: 3

10. Molly's utility function is $U(x, y) = y + 4x^5$. She has 25 units of x and 12 units of y . If her consumption of x is reduced to 0, how many units of y would she need in order to be exactly as well off as before?
- a. 48
 - b. 37
 - c. 32
 - d. 112
 - e. None of the above.

ANS: C DIF: 2

11. Waldo's utility function is $U(x, y) = xy$. Waldo consumes 5 units of x and 25 units of y .
- a. Waldo would be willing to make small exchanges of x for y in which he would give up 5 units of x for every unit of y he got.
 - b. Waldo would be willing to trade away all of his x for y as long as he got more than 5 units of y for every unit of x he gave up.
 - c. Waldo likes x and y equally well so he is always willing to exchange 1 unit of either good for more than 1 unit of the other.

- d. Waldo will always be willing to make trades at any price if he does not have equal amounts of the two goods.
- e. None of the above.

ANS: E DIF: 2

12. Ike's utility function is $U(x, y) = xy$. Ike consumes 2 units of x and 8 units of y .
- a. Ike would be willing to make small exchanges of x for y in which he would give up 4 units of x for every unit of y he got.
 - b. Ike would be willing to trade away all of his x for y as long as he got more than 4 units of y for every unit of x he gave up.
 - c. Ike will always be willing to make trades at any price if he does not have equal amounts of the two goods.
 - d. Ike likes x and y equally well so he is always willing to exchange 1 unit of either good for more than 1 unit of the other.
 - e. None of the above.

ANS: E DIF: 2

13. Henry's utility function is $x^2 + 16xw + 64w^2$, where x is his consumption of x and w is his consumption of w .
- a. Henry's preferences are nonconvex.
 - b. Henry's indifference curves are straight lines.
 - c. Henry has a bliss point.
 - d. Henry's indifference curves are hyperbolas.
 - e. None of the above.

ANS: B DIF: 2

14. Josephine's utility function is $U(x, y) = y + 5x^5$. She has 1 unit of x and 2 units of y . If her consumption of x is reduced to zero, how much y must she have in order to be exactly as well off as before?
- a. 14 units
 - b. 9 units
 - c. 11 units
 - d. 7 units
 - e. None of the above.

ANS: D DIF: 1

15. Jim's utility function is $U(x, y) = xy$. Jerry's utility function is $U(x, y) = 1,000xy + 2,000$. Tammy's utility function is $U(x, y) = xy(1 - xy)$. Oral's utility function is $-1/(10 + xy)$. Billy's utility function is $U(x, y) = x/y$. Pat's utility function is $U(x, y) = -xy$.
- a. No two of these people have the same preferences.
 - b. They all have the same preferences except for Billy.
 - c. Jim, Jerry, and Pat all have the same indifference curves, but Jerry and Oral are the only ones with the same preferences as Jim.

- d. Jim, Tammy, and Oral all have the same preferences.
e. None of the above.

ANS: C DIF: 2

16. Harmon's utility function is $U(x_1, x_2) = x_1x_2$. His income is \$100. The price of good 2 is $p_2 = 4$. Good 1 is priced as follows. The first 15 units cost \$4 per unit and any additional units cost \$2 per unit. What consumption bundle does Harmon choose?
- (12.5, 12.5)
 - (25, 12.5)
 - (12.5, 25)
 - (15, 10)
 - None of the above.

ANS: A DIF: 1

17. Janet consumes x_1 and x_2 together in fixed proportions. She always consumes 2 units of x_1 for every unit x_2 . One utility function that describes her preferences is
- $U(x_1, x_2) = 2x_1x_2$.
 - $U(x_1, x_2) = 2x_1 + x_2$.
 - $U(x_1, x_2) = x_1 + 2x_2$.
 - $U(x_1, x_2) = \min\{2x_1, x_2\}$.
 - $U(x_1, x_2) = \min\{x_1, 2x_2\}$.

ANS: E DIF: 1

18. Oswald Odd consumes only goods 1 and 2. His utility function is $U(x_1, x_2) = x_1 + x_2 + \min\{x_1, x_2\}$. Each of Oswald's indifference curves is
- L-shaped.
 - made up of three line segments with slopes -2 , -1 , and $-1/2$.
 - made up of two line segments with slopes -2 and $-1/2$.
 - is smooth and has no kinks.
 - is a diamond-shaped figure consisting of four line segments.

ANS: C DIF: 3

19. The absolute value of Mar's MRS at his current consumption bundle is greater than 3. (That is, $MU_1/MU_2 > 3$). Mars has convex preferences and is currently consuming positive amounts of both goods.
- Taking away some of good 1 and giving Mars 3 units of good 2 for each unit of good 1 taken away will necessarily make him worse off.
 - Taking away some of good 1 and giving Mars 3 units of good 2 for each unit of good 1 taken away will necessarily make him better off.
 - Giving Mars some of good 1 and taking away 3 units of good 2 for each unit of good 1 he is given will necessarily make him worse off.

- d. Giving Mars some of good 1 and taking away 3 units of good 2 for each unit of good 1 he is given will necessarily make him better off.
e. More than one of the above is true.

ANS: A DIF: 3

20. Isabella's utility function is $U(x, y) = 4\min\{x, y\} + y$. If we draw her indifference curves with x on the horizontal axis and y on the vertical axis, these indifference curves are
- L-shaped with kinks where $x = y$.
 - made up of two line segments that meet where $x = y$. One of these line segments is horizontal and the other has slope -4 .
 - L-shaped with kinks where $x = 5y$.
 - made up of two line segments that meet where $x = 5y$. One of these line segments is vertical and the other has slope -1 .
 - V-shaped with kinks where $x = 4y$.

ANS: B DIF: 3

21. Emily's utility function is $U(x, y) = 3\min\{x, y\} + y$. If we draw her indifference curves with x on the horizontal axis and y on the vertical axis, these indifference curves are
- made up of two line segments that meet where $x = 4y$. One of these line segments is vertical and the other has slope -1 .
 - L-shaped with kinks where $x = 4y$.
 - L-shaped with kinks where $x = y$.
 - made up of two line segments that meet where $x = y$. One of these line segments is horizontal and the other has slope -3 .
 - V-shaped with kinks where $x = 3y$.

ANS: D DIF: 3

22. Charlie has the utility function $U(x_A, x_B) = x_Ax_B$. His indifference curve passing through 32 apples and 8 bananas will also pass through the point where he consumes 4 apples and
- 16 bananas.
 - 32 bananas.
 - 68 bananas.
 - 72 bananas.
 - 64 bananas.

ANS: E DIF: 1

23. Charlie has the utility function $U(x_A, x_B) = x_Ax_B$. His indifference curve passing through 35 apples and 18 bananas will also pass through the point where he consumes 5 apples and
- 131 bananas.
 - 137 bananas.