Easy multiple choice 4

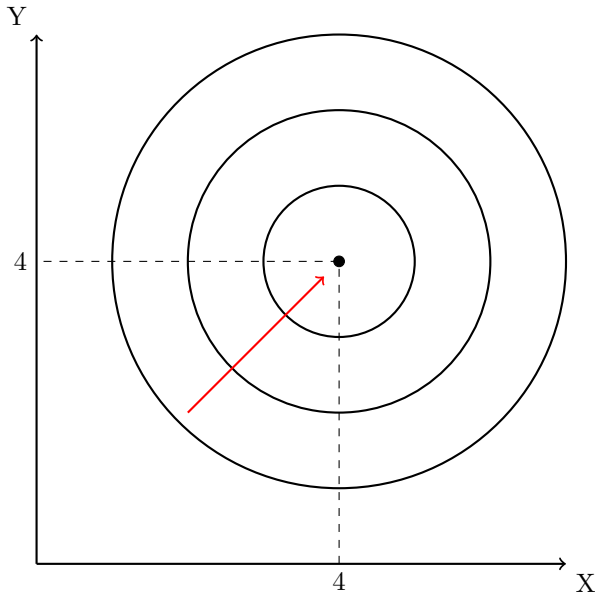
1. Given the preferences represented in the following graph, the basket containing 400 of good X and 200 of good Y is equivalent to:

   (a) 200 of X and 300 of Y
   (b) 600 of X and 150 of Y
   (c) 400 of X and 300 of Y
   (d) All of the above
   (e) None of the above

2. A person states that they strictly prefer basket B to basket A. They are indifferent between baskets D and E but strictly prefer basket F to basket B. Assuming this person has rational preferences, then:

   (a) They prefer basket F to basket D.
   (b) They prefer basket D to basket F.
   (c) The preferences are not transitive, thus they cannot be rational.
   (d) Both the first and second options are correct.
   (e) There is not enough information to answer.

3. In the following figure, Alberto's preferences are represented. It can be observed that the indifference curves are circular and that utility levels increase towards the point where Alberto consumes 4 units of each good. What properties discussed in class do the views in the figure comply with regarding preferences?



(a) They comply with Strict Monotonicity and Convexity.

(b) They comply with Strict Monotonicity but not with Convexity.

(c) They do not comply with Monotonicity but do comply with Strict Convexity.

(d) They comply neither with Monotonicity nor Convexity.

(e) None of the above is correct.

4. Argentina has a workforce of 50,000 programmers. Each programmer can work a maximum of 8 hours per day. Creating a web page takes 32 hours of work, while performing a cybersecurity service takes 12 hours. Determine which of the following equations represents the production possibilities frontier for Argentina in these two services, where x_w is the number of web pages developed and x_s is the number of cybersecurity services performed.

   (a) $x_w = 12500 - \frac{3}{8}x_s$

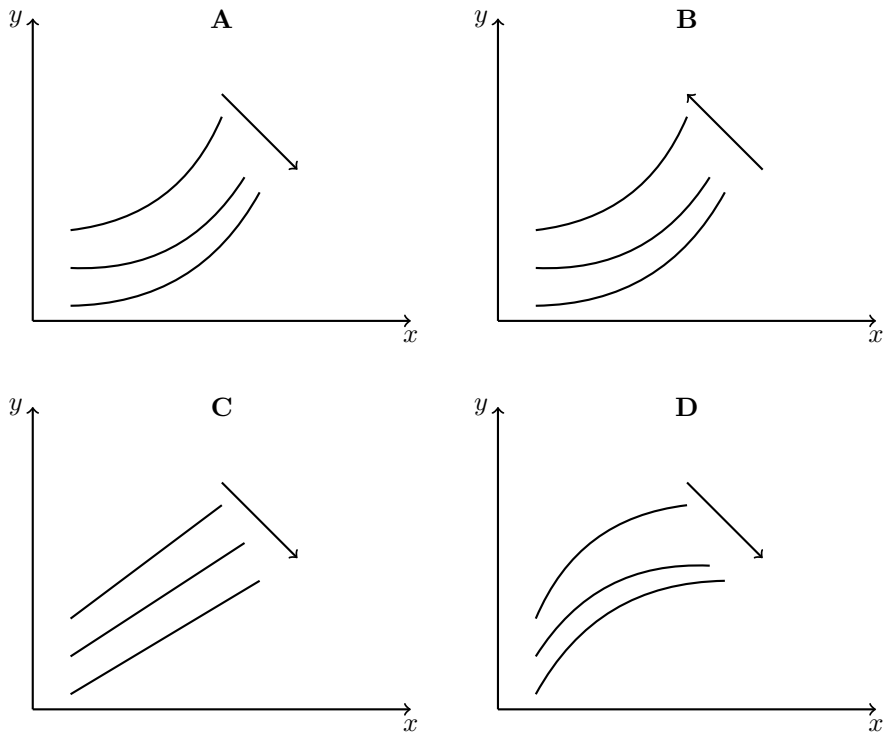
   (b) $x_w = 3125 - \frac{3}{2}x_s$

   (c) $x_s = 12500 - \frac{3}{8}x_w$

   (d) $x_s = 50000 - \frac{8}{3}x_w$

   (e) None of the above.

5. Lucía does not like to work, but she likes to go out for lunch. We know that Lucía is indifferent between two baskets, one with a lot of work and many lunches, and another with little of both, a combination of these two (i.e., a basket with moderate amounts of work and lunches) she likes more than both initial baskets. Given this information, which of the following indifference curves could represent her preferences, where x is the number of lunches and y is the number of hours worked?



(a) A
(b) B
(c) C
(d) D
(e) None of the above.

6. In the kingdom of Strak, a typical worker can produce 4 kg of bread in 40 minutes and 4 kg of wool in 120 minutes. Conversely, in the kingdom of Lanster, a typical worker can produce 4 kg of bread in 100 minutes and 4 kg of wool in 150 minutes. Assuming the kingdoms specialize in the production of the good for which they have comparative advantages and trade, if the kingdom that imports wool does so by exchanging 8 kg of bread for 4 kg of wool, then:

   (a) Strak benefits and Lanster remains indifferent.
   (b) Lanster benefits and Strak remains indifferent.
   (c) Both kingdoms benefit.
   (d) Neither benefits from trade.
   (e) Strak benefits and Lanster is harmed.

7. Marcos, an amateur tennis player, needs to buy tennis balls every two months. In his city, only three brands of tennis balls (Head, Wilson, and Penn) are available. When the balls are in good condition, Marcos considers one ball of any brand perfectly substitutable with another from a different brand. Additionally, he only uses balls in good condition.

   It is known that Head balls last twice as long in good condition as Penn balls, and Wilson balls last 1.5 times as long as Penn balls. If x_h, x_w, and x_p refer to the quantity of Head, Wilson, and Penn brand tennis balls respectively, which of the following utility functions could represent Marcos' preferences?

   (a) $U(x_h, x_w, x_p) = \min\left(\frac{x_h}{2}, \frac{3x_w}{2}, 3x_p\right)$
   (b) $U(x_h, x_w, x_p) = 3x_h + \frac{3x_w}{2} + x_p$

(c) $U(x_h, x_w, x_p) = 6x_h + 3x_w + 2x_p$

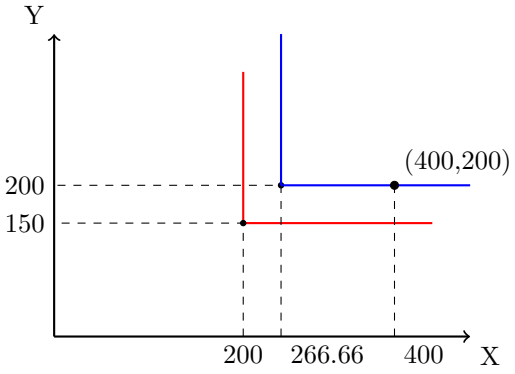
(d) Both 2 and 3 are correct.

(e) None is correct.

Solutions

1. **e) None of the above**. Optimum quantities should have the relation 200 of X and 150 of Y. This means: 4/3. In the case of $(400, 200)$ the relation is 1/2. This means that we are not in an optimum situation and if we add more of X we won't have more utility, and if we add more of Y we will be in a better situation.

$$U(400, 200) = U(500, 200) = U(600, 200) = U(266.66, 200) = U(266.66, 250)$$



2. **d)** There is not enough information to answer, as none of the relationships specifies anything about F and D or about D and F, whether they prefer one over the other.

3. **c)** The correct option is that monotonicity is not satisfied, but strict convexity is satisfied. This is because the set of preferred baskets is a convex set. If any indifference curve behind a straight line between two points is considered, the baskets forming that line are strictly preferred to the two baskets at the ends.

4. **a)** The correct answer is the first equation. We can calculate that if all the resources go to web pages:

$$\frac{50000 * 8}{32} = 12500$$

   If all the resources go to cybersecurity:

$$\frac{50000 * 8}{12} = 33333.3333$$

   With $(12500, 0)$ and $(0, 33333.3333)$, we can find the line:

$$x_w = 12500 - \frac{3}{8}x_s$$

5. **d)** The correct answer is option D, as these curves represent a good and a bad. They increase towards the side of the good that generates utility and decrease the utility towards the side of the other good. Moreover, these curves show the set of preferred baskets as a convex set, meaning that a combination between two extreme baskets generates greater utility than any of the baskets at the extremes.

6. **c)** The correct answer is that both benefit from the trade. To understand why, let's consider that 4 kg of wool is equivalent to 1 piece of wool, and 4 kg of bread is equivalent to 1 piece of bread. Strak produces bread because the cost of 1 bread is 1/3 of wool, meanwhile, for Lanster the cost of 1 bread is 2/3 of 1 wool. The maximum price that Strak would pay for wool is 3 breads. And the minimum price that Lanster would accept for wool is 3/2 of bread. The exchange rate implies a relative price of 2 breads for 1 wool. Since:

$$3/2 < 2 < 3$$

   Both benefit from trade.

7. **d)** Since goods are substitutes option a) is discarded. Then we want to check if $U(1,0,0) = U(0,2,0) = U(0,0,3)$. Because the substitute rate is 1 Head equals 2 Wilson. And 1 Wilson equals 1.5 Penn. Let's check for the option b):

$$3 * 1 + 0 + 0 = 0 + 3 * 2/2 + 0 = 0 + 0 + 3$$

Since options b) satisfy the equality and option c) is just a strictly monotonic transformation of option b), both utility functions represent the same preferences.