Section Exercises for January 25/26 with Answers:

1) The economy of the university town of Avicenna (if you wish, cf.: Peter Beagle (1986): The Folk of the Air http://amzn.to/1RxRFQJ (New York: Del Rey: 0345337824)) produces two and only two commodities: yoga lessons, and triple lattes. The economy is able to produce any of the following combinations of yoga and lattes per day:

Daily Production in Avicenna

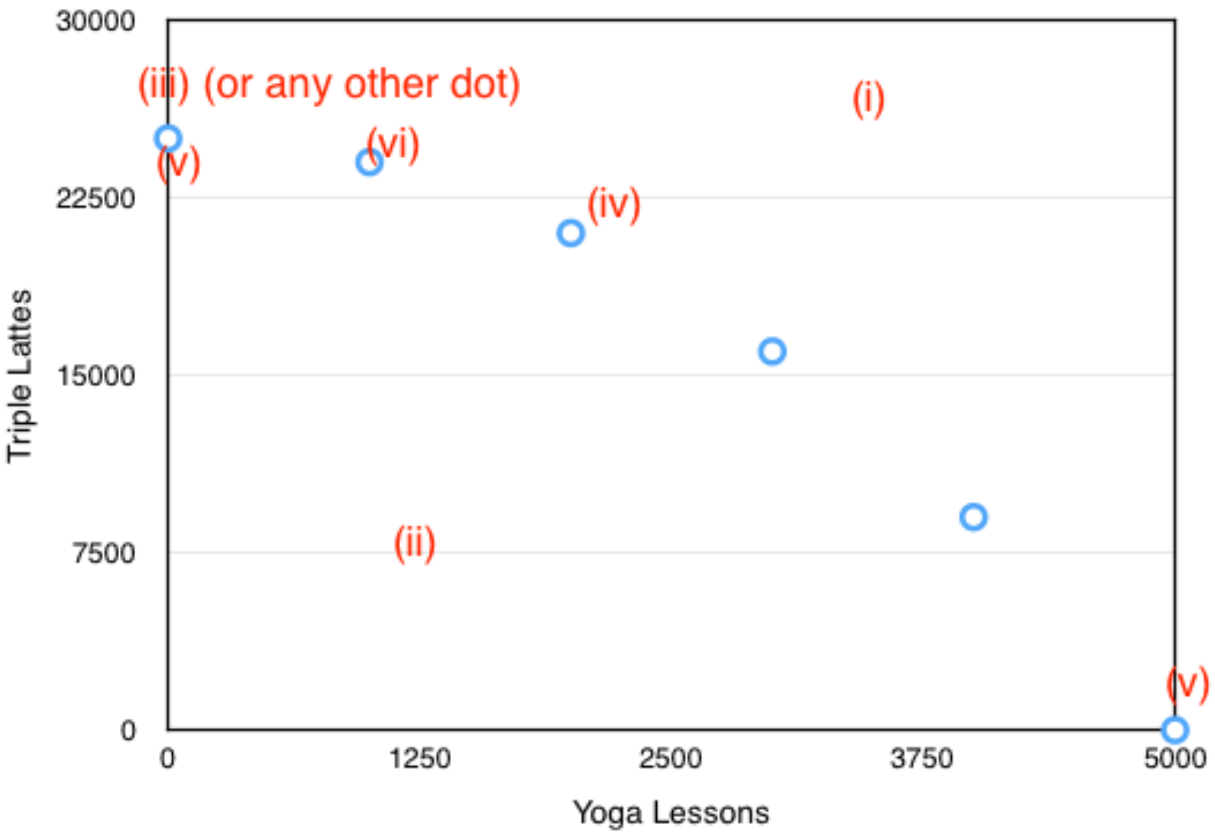
Combination	Yoga Lessons	Triple Lattes
A	5000	0
B	4000	9000
C	3000	16000
D	2000	21000
E	1000	24000
F	0	25000

a) Using the data in the table, graph the daily production possibilities frontier (ppf) of the Avicenna economy. Put triple lattes ("TL") on the vertical axis.

b) Does the principle of "increasing opportunity cost" hold in this town's economy? Think about what happens to the opportunity cost of TLs—measured in units of yoga lessons ("YL")—as the amount of resources devoted to producing TLs increases. Explain briefly.

Yes. If you are producing no TLs, than diverting the resources to produce 1000 YLs gets you 9000 additional TLs. But if you are producing 24000 TL, diverting the resources to produce 1000 YLs gets you only 1000 additional TLs.

c) On your graph, pick and label one point that is: (i) an impossible and unattainable level of YL and TL production, (ii) an attainable but inefficient level of YL and TL production, (iii) an efficient level of production of YL and TL, (iv) a value-maximizing level of production of YL and TL if a TL is worth $2.50 and a YL is worth $10; (v) a value-maximizing level of production of YL and TL if a TL is worth $1 and a YL is worth $10; and (vi) a value-maximizing level of



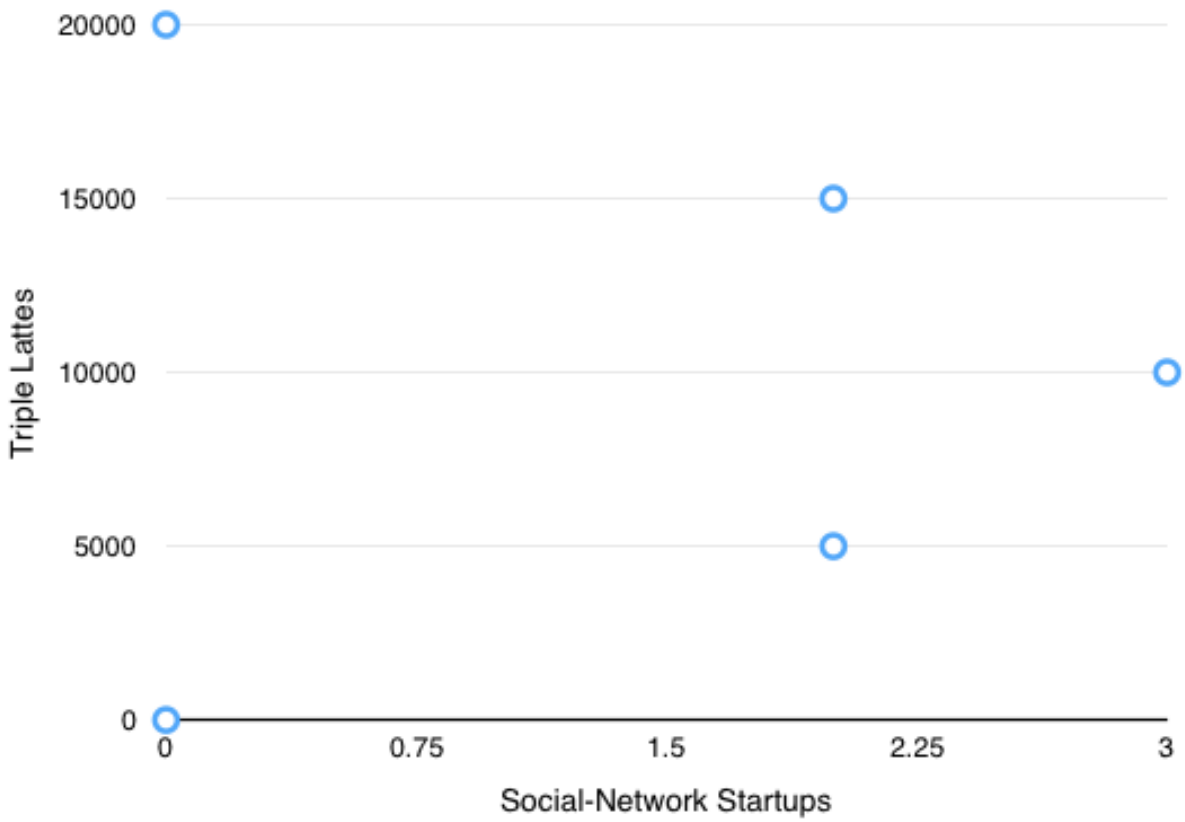
production of YL and TL if a TL is worth $5 and a YL is worth $10.

2) The economy of the university town of Old Stick, home of Crony Capitalism University, produces two and only two commodities: social network startups ("SNS"), and triple lattes (TL). The economy is able to produce any of the following combinations of SNSs and TLs per day:

Daily Production in Old Stick

Combination	Social-Network Startups	Triple Lattes
A	0	0
B	2	5000
C	3	10000
D	2	15000
E	0	20000

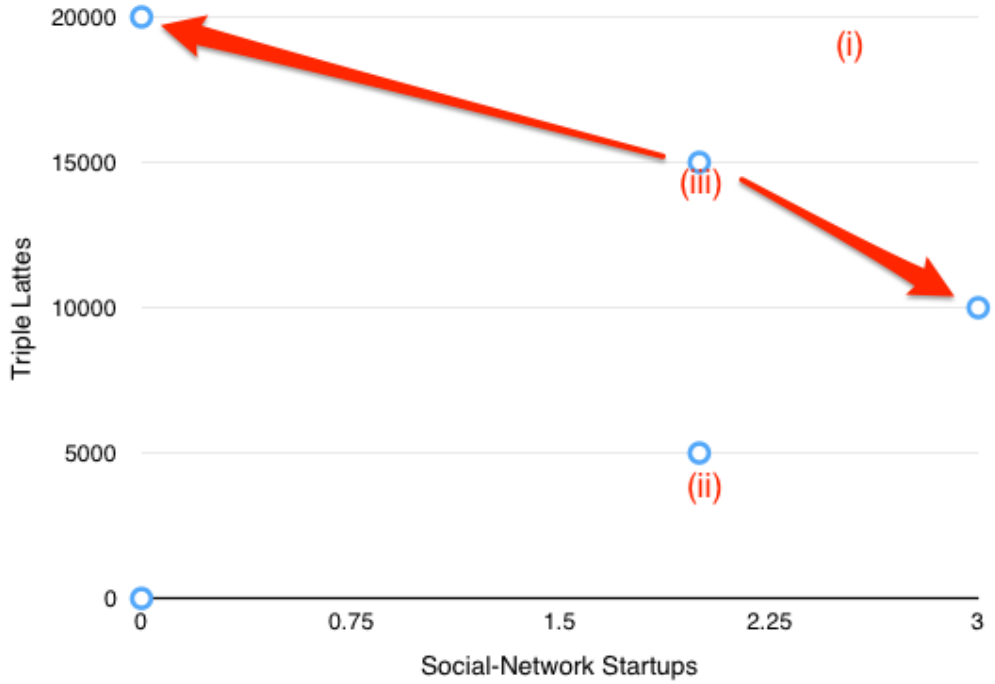
a) Using the data in the table, graph the daily production possibilities frontier (ppf)



of the Old Stick economy. Put triple lattes ("TL") on the vertical axis.
b) Does the principle of "increasing opportunity cost" hold in this town's economy? Think about what happens to the opportunity cost of SNSs—measured in units of TLs—as the amount of resources devoted to producing TLs increases. Explain briefly.

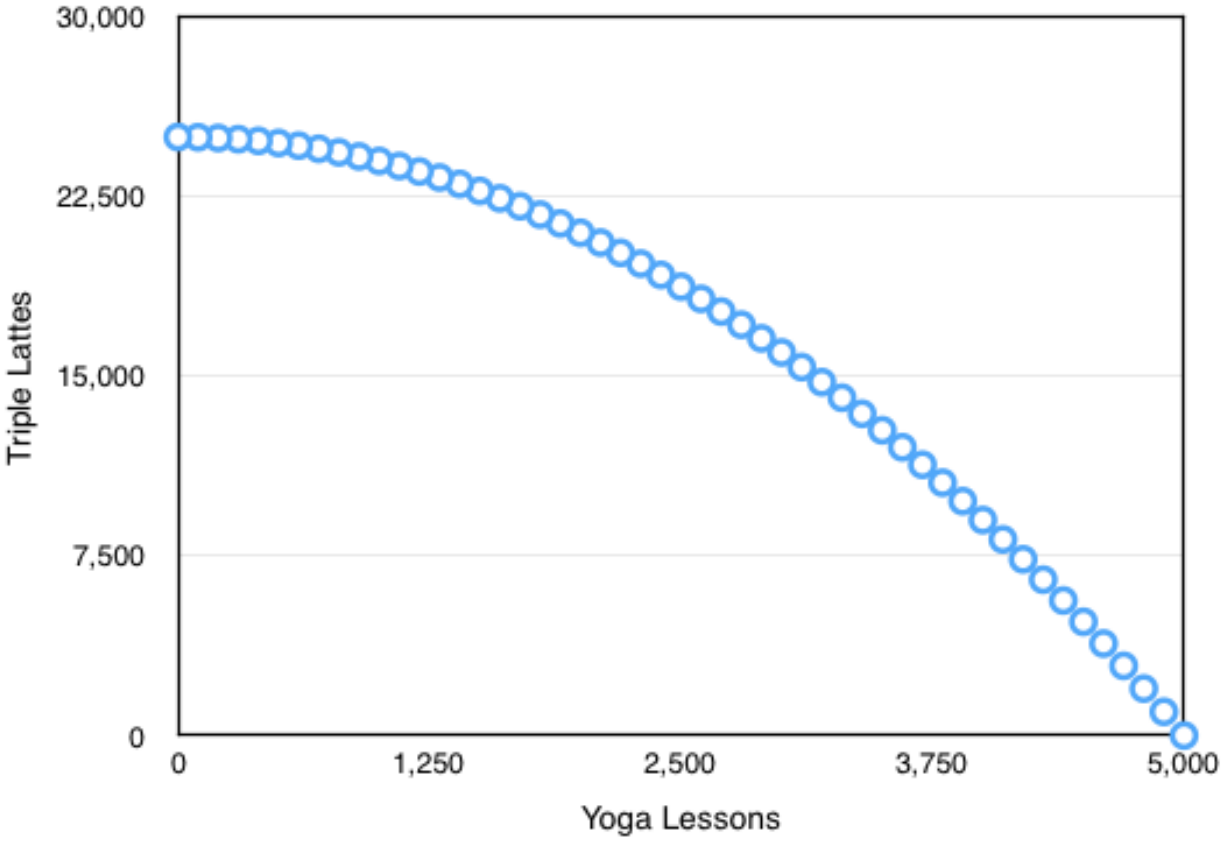
Sometimes. As more resources are devoted to producing TLs, the opportunity cost of producing SNSs in terms of TLs falls *only after you are already producing 10000 TLs.* Below that production level, there is no scarcity: you can have more of both—more coffee, apparently, makes programmers more productive up to a point.

c) On your graph, pick and label one point that is: (i) an impossible and unattainable level of SNS and TL production, (ii) an attainable but inefficient level of SNS and TL production, (iii) an efficient level of production of SNSs and TLs.



3) The economy of the university town of Avicenna (if you wish, cf.: Peter Beagle (1986): *The Folk of the Air* http://amzn.to/1RxRFQJ (New York: Del Rey: 0345337824)) produces two and only two commodities: yoga lessons, and triple lattes. The economy is able to produce combinations of yoga YL and lattes TL per day given by: $TL = 25000 - (YL)^2 /1000$.

a) Using the equation, graph the daily production possibilities frontier (ppf) of the



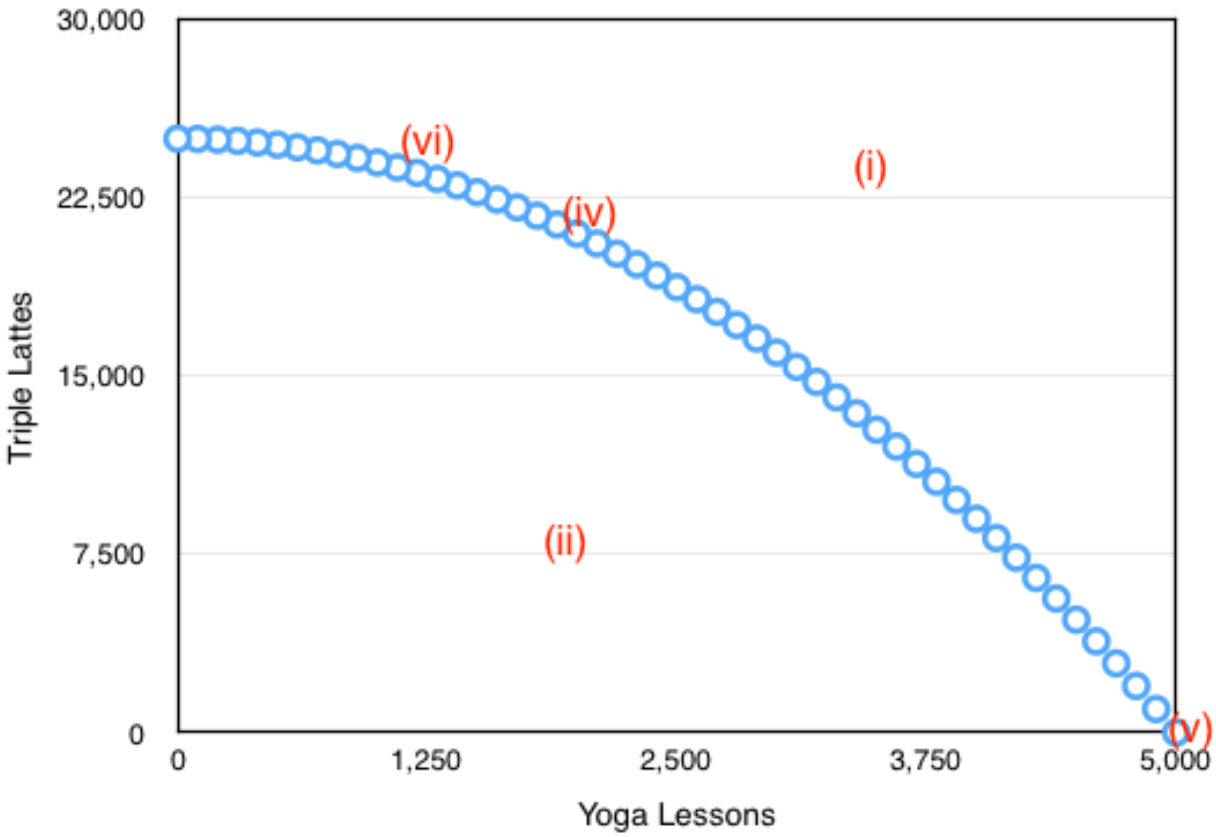
Avicenna economy. Put triple lattes ("TL") on the vertical axis

b) Does the principle of "increasing opportunity cost" hold in this town's economy? Think about what happens to the opportunity cost of TLs—measured in units of yoga lessons ("YL")—as the amount of resources devoted to producing TLs increases. Explain briefly.

Yes. For the equation TL = 25000 - $(YL)^2$ /1000 the derivative d(TL)/d(YL)—the amount of TLs you tradeoff by changing the number of YLs—is -(YL)/500. Thus the more YLs you produce, the more TLs you get by diverting a given amount of resources from YL to TL production

c) On your graph, pick and label one point that is: (i) an impossible and unattainable level of YL and TL production, (ii) an attainable but inefficient level of YL and TL production, (iii) an efficient level of production of YL and TL, (iv) a

value-maximizing level of production of YL and TL if a TL is worth $2.50 and a YL is worth $10; (v) a value-maximizing level of production of YL and TL if a TL is worth $1 and a YL is worth $10; and (vi) a value-maximizing level of



production of YL and TL if a TL is worth $5 and a YL is worth $10.

For (iv), (v), and (vi), you can calculate by brute force using a spreadsheet:

Combination	Yoga Lessons	Triple Lattes	(iv): TL $2.50, YL $10	(v): TL $1, YL $10	(vi): TL $5, YL $10
A	5000	0	$50000	$50000	$50000
B	4750	2437.5	$53594	$49938	$59688
C	4500	4750	$56875	$49750	$68750
D	4250	6937.5	$59844	$49438	$77188
E	4000	9000	$62500	$49000	$85000
F	3750	10937.5	$64844	$48438	$92188
A	3500	12750	$66875	$47750	$98750
B	3250	14437.5	$68594	$46938	$104688
C	3000	16000	$70000	$46000	$110000
D	2750	17437.5	$71094	$44938	$114688
E	2500	18750	$71875	$43750	$118750
A	2250	19937.5	$72344	$42438	$122188
B	2000	21000	$72500	$41000	$125000
C	1750	21937.5	$72344	$39438	$127188
D	1500	22750	$71875	$37750	$128750
E	1250	23437.5	$71094	$35938	$129688
A	1000	24000	$70000	$34000	$130000
B	750	24437.5	$68594	$31938	$129688
C	500	24750	$66875	$29750	$128750
D	250	24937.5	$64844	$27438	$127188
E	0	25000	$62500	$25000	$125000

But it is easier and more straightforward to remember your calculus and the derivative d(TL)/d(YL) along the PPF. It is d(TL)/d(YL) = -(YL)/500. That means that if you give up one yoga lesson, you get YL/500 triple lattes. Thus the net gain in money from giving up one yoga lesson is:

for (iv), where a TL is worth $2.50 and a YL is worth $10, your net gain in money from giving up a YL is 2.50 x YL/500 - 10, and the is positive for YL>2000 and negative for YL<2000, so 2000 is the amount of YLs (and 21000 the amount of TLs) that generates the most value.

for (v) where a TL is worth $1 and a YL is worth $10, your net gain in money from giving up a YL is 1 x YL/500 - 10, and the is positive for YL>5000 and negative for YL<5000, so 5000 is the amount of YLs (and 0 the amount of TLs) that generates the most value.

for (vi), where a TL is worth $5 and a YL is worth $10, your net gain in money from giving up a YL is 5 x YL/500 - 10, and the is positive for YL>1000 and negative for YL<1000, so 1000 is the amount of YLs (and 24000 the amount of TLs) that generates the most value.

d) What is the difference between your answer to (1) and your answer to this question (3)?

There should not be any difference. The equation tells you the same thing as the table, and the table tells you the same thing as the equation…