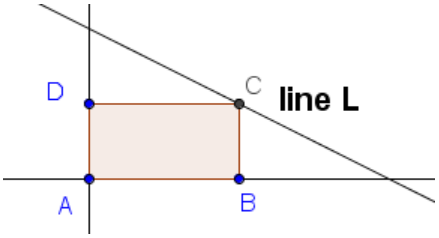
VD unit 2 topic 1 part 2
Question 1 – 4 use the prompt from “tomato garden”:

Tomato Garden

Herald has a triangular backyard. (the triangle bounded by x-axis, y-axis, and line L) He plants tomatoes in the rectangular area ABCD.



(a) Find the coordinates of C so that he can maximize the rectangle.

(b) What is the area of ABCD when it reaches its maximum?

(Question 1) L: $3x+4y=15$

(Question 2) L: $4x+5y=16$

(Question 3) L: $2x+5y=20$

(Question 4) L: $\frac{x}{3}+\frac{y}{4}=6$

Q1: $C(\frac{5}{2},\frac{15}{8})$, $ABCD=\frac{75}{16}$	**Q2:** $C(2,\frac{8}{5})$, $ABCD=\frac{16}{5}$
Q3: $C(5,2)$, $ABCD=10$	**Q4:** $C(9,12)$, $ABCD=108$

Question 5-8 from prompt of “Fencing”

Fencing:

A rectangular field will be fenced on all 4 sides. There will also be **n lines** of fence across the field as partitions, with {see details in configuration}. If total of L meters of fencing are available, what dimensions of the field will produce the maximum area? What is the maximum area?

Question #	n	configuration	L
Question 5	2	One parallel and one perpendicular to the short sides	800
Question 6	2	both parallel to the short sides	1120
Question 7	3	all 3 parallel to the short sides	1200
Question 8	5	2 parallel and 3 perpendicular to the short sides	1500

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(In case you don't know how to substitute the given info into the question, here is an example for question 8, when n, configuration, and L are substituted into the question. Underlined texts are substituted from the table above.)

> A rectangular field will be fenced on all 4 sides. There will also be 5 lines of fence across the field as partitions, with 2 parallel and 3 perpendicular to the short sides. If total of 1500 meters of fencing are available, what dimensions of the field will produce the maximum area? What is the maximum area?

Q5: dimension = $\frac{400}{3}\times 400$ (m x m) Area = $\frac{160000}{3}\ m^2$	Q6 dimension = 280×140 (m x m) Area = $39200\ m^2$
Q7: dimension = 120×300 (m x m) Area = $36000\ m^2$	Q8 dimension = $\frac{375}{2}\times 150$ (m x m) Area = $28125\ m^2$