

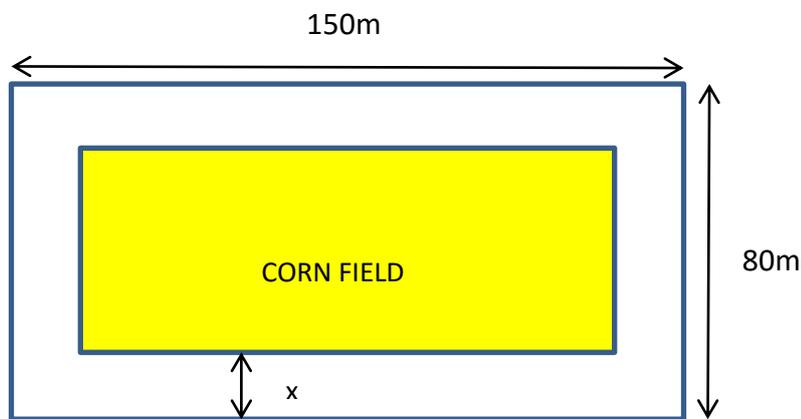
Sujet N°19

Please do not write on the exam paper, and do not forget to give it back at the end of the test.

FUNCTIONS

An uncultivated land for the bees

In a beautiful countryside there is a rectangular field (length: 150m, width: 80m) where transgenic corn grows. All around the field, organic beekeepers want to protect their bees from transgenic pollution. So they ask Bob, the corn grower, to decrease the dimensions of his field in order to leave a narrow stretch of land set aside. The European Union agrees to pay him a sum not exceeding 25% of the sum earned by the total field area. Let x be the width of this narrow stretch of set aside land. The purpose of the exercise is to help the farmer calculate the new dimensions of the corn field.



1. What are the extreme values possible for x , the width of land set aside?
2. What is the percentage of the field set aside when x is equal to 5 meters? To 10 meters?
3. Now, we call $A(x)$ the total area of the land set aside. Give the expression of $A(x)$ and use your calculator to solve the problem graphically.
4. Using the TABLE function of your calculator, find a range of values rounded up to 0.01m for x which would meet the conditions above.
5. Give the algebraic equation which satisfies the problem conditions, and then solve it.

VOCABULARY:

Bee : abeille

Corn field: champ de maïs

Narrow stretch of land set aside: étroite bande de terre en jachère

Beekeeper: apiculteur