A Field of Rabbits

In a Year 12 class, students were asked to solve the following problem using GeoGebra:

“A biologist is interested in the population of rabbits in a rectangular field with dimensions 12km by 15km. However, for the survey to be scientifically rigorous, they would need to investigate an area of 208km². The biologist extends both dimensions by x km. What is x?”

Student A and Student B work on their computers next to each other. They agree that the area of the extended field is given by the equation \((12+x) \times (15+x) = 208\) and decide to solve the problem graphically. They rearrange the equation to form the function:

\[ y = (12+x) \times (15+x) - 208 \]

and make the graph in GeoGebra. Student A obtains the image below and says:

**Student A:** Okay, so that seems to be a line that crosses the x-axis at 1, so the solution is 1 and the dimensions of the rectangular field are 13 and 16. And 13 times 16 is 208. So, x is 1km.

**Student B:** But this is not a line, it is a curve and has two solutions. Look at my screen:

Questions:

a. How would you solve this problem, with or without the use of digital technology?
b. What is the aim of using this activity in class?
c. What do you think are the issues in Student A’s and Student B’s responses?
d. How would you respond to these students and the whole class, in particular bearing in mind the potentialities in the use of digital resources?