## Optimization

1) Sadie and Sophia decide to become farmers and need to buy all of their farming supplies on a budget. They only have 750 feet of fencing with which to work and want to enclose a rectangular area dividing it into a row of four equal subdivisions. Find the maximum total area possible with this much fencing.

2) Rachel and Aryanna think that Sadie and Sophia are doing it all wrong and need to decide on an area first then find the minimum amount of fencing needed to enclose that area. They decide to enclose 15,000 square feet with the same 4 subdivisions. Find the minimum amount of fencing that they will need.

3) Shay and Julia need to find a way to use the least amount of cardboard to make a closed box with square ends and a volume of 8 m<sup>3</sup>. Since they are too distracted by Carter who wants to help because of FOMO, Otto has to figure it out himself. How much cardboard will Otto need?

4) Pogo rolls her eyes at all of this confusion and tells them that they would be better off finding a way to use 25 m<sup>2</sup> of cardboard and maximize the volume. Will they produce a box with greater volume?