Problem 1:

1. Of all rectangles with perimeter 12 which one has maximum area?

2. What is the area of a regular hexagon of side length 2?

3. What is the area of a regular dodecagon of side length 1?

4. Find a formula for the area for a regular $2m$-gon with perimeter 12. Compute the corresponding IQ. What happens to the formula as $m \to \infty$?

Problem 2: Assuming that we have solved the isoperimetric problem what would you do if you found yourself in Princess Dido's situation? Princess Dido, daughter of a Tyrian king and future founder of Carthage purchased from the North African natives an amount of land along the coastline *not larger than what an oxhide can surround*. She cut the oxhide into strips and made a very long string of length L. And then she faced the geometrical problem of finding the region of maximal area enclosed by a curve, given that she is allowed to use the shoreline as part of the region boundary. In the interior of the continent the answer would be the circle, but on the seashore the problem is different.