Exercise 1. A rectangular box has a square base with edges at least 1 cm long. Its total surface area is 600 cm^2. What is the largest possible volume that such a box can have?

Exercise 2. A right circular cone (with no base) is to be constructed from a circular disk of metal by removing a wedge from the disk and then connecting the two newly exposed edges. If the disk has a radius of 5 m, what is the largest possible volume of the resulting cone?

Exercise 3. Show that the rectangle of maximal area that can be inscribed in a circle is a square.