— Reading —

1. Quickly read Chapter 11. Skip all proofs and computations.
   For pages 506 to 511, only Th. 11.4.2, Th. 11.4.3 and Th. 11.4.4
   For Sect. 11.5, only Def. 11.5.1 and Th. 11.5.1
   Omit Sect. 11.6

2. Quickly read Chapter 12 Sect. 12.1, 12.2, 12.3, 12.4. Skip all proofs and computations.
   For Sect. 12.4 omit Th. 12.4.4; omit pages 557 to 559

— Problem —

3. **Lemoine point of a triangle.** Let T be a triangle whose edges have positive lengths a, b and c, and with area S. If M is a point of T, we call x (resp. y, z) the distance of M to edge of length a (resp. b,c). We want to find the Lemoine point of T, i.e. the point minimizing the sum $x^2 + y^2 + z^2$ of squared distances to the edges of T.

   (a) Show that we have $2S = ax + by + cz$.

   (b) Prove that the Lemoine point exists.

   (c) We assume that Lemoine point is in the interior of T. Compute its "coordinates" (x, y, z) using Lagrange method.

   (d) Show that Lemoine point is in the interior of T.