Hints 15-16

15.1. Compute in the upper half-plane (don't forget first to place the triangle nicely).

15.2.
- Use the same notation as in the proof of Pythagorean Theorem (see the figure below).
- First, show that

$$\sin^2\alpha = \frac{(2k\cos\varphi)^2}{(1-k^2)^2 + 4k^2\cos^2\varphi}.$$

- Square the required expressions, express $\tanh^2$ and $\sinh^2$ through $\cosh^2$ and use the distance formula to get the latter.

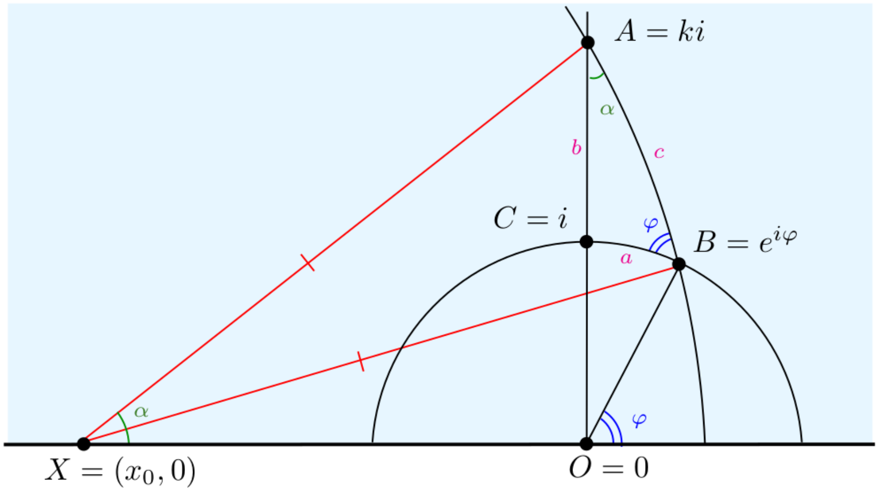

Figure 1: Notation for Quesion 15.2.

15.3. Use the definitions of sinh and cosh as half-sum of two exponents.

15.5. Take one point on the given distance from the line and apply some isometries to get more points on the same distance.

16.2. Place your triangle in the Klein model in such a way that all altitudes will be represented by the altitudes of Euclidean triangle.

16.3. To compute, place the objects so that the required distance will be a length of the segment lying in the plane $z_2 = 0$, then everything is reduced to 2-dimensional problem.

16.4. Use formulae listed in 16.3.