

## Homework 9-10

- 9.1. Use “cut and paste” argument, cutting and regluing the the space into the Möbius band.
- 9.3. Glue the paper Möbius band, take a pair of scissors and cut...
- 9.5. Use polarity.
- 9.7. (a) Substitute points by lines, lines by points,  
a line through two points by a point of intersection of two lines,  
intersection of two lines by a line through two points,  
concurrency of lines by collinearity of points (and backwards).  
(c) Send the line  $s$  to infinity, then the theorem will turn into quite an easy question of Euclidean geometry (or, may be better to say, of affine geometry, as its solution will use a homothety).
- 10.2. Recall when a line in the Klein model is orthogonal to a given line - this will give you a unique way to draw a common perpendicular to the pair of divergent lines.
- 10.3. A right angle in the Klein model is most easily seen at the centre of the model. So, take one vertex of the polygon point to the centre and try to construct (using what you know about orthogonal lines in the Klein model).