

Math 4300 - Homework # 6

Angles and Triangles

1. In the Euclidean plane, let $A = (0, 0)$, $B = (-1, 1)$, and $C = (1, 1)$.

- (a) Draw an accurate picture of $\angle ABC$.
- (b) Draw an accurate picture of $\triangle ABC$.

2. In the hyperbolic plane, let $A = (1, 2)$, $B = (1, 4)$, and $C = (3, 4)$.

- (a) Draw an accurate picture of $\angle ABC$.
- (b) Draw an accurate picture of $\triangle ABC$.

3. Let $(\mathcal{P}, \mathcal{L}, d)$ be a metric geometry. Let A, B, C be three noncollinear points.

- (a) Prove that

$$\angle ABC = \angle CBA$$

- (b) Prove that

$$\triangle ABC = \triangle ACB = \triangle BAC = \triangle BCA = \triangle CBA = \triangle CAB$$

4. Let $(\mathcal{P}, \mathcal{L}, d)$ be a metric geometry. Let B and Z be points with $B \neq Z$. Prove that there exists a point D such that $D \in \overrightarrow{BZ}$ and $B - Z - D$.
