Math 331: Homework 4
Due: Wednesday, October 22nd

1 (5.1.1) Let $A = (0, 1)$, $B = (0, 5)$, and $C = (3, 4)$ be points in the Poincaré Plane $\mathcal{H}$. Sketch $\triangle ABC$ and find the sum of the measures of the angles of $\triangle ABC$.

2 (5.1.2) Let $A = (0, 5)$, $B = (0, 3)$, and $C = (2, \sqrt{21})$ be points in the Poincaré Plane $\mathcal{H}$. Sketch $\triangle ABC$ and find the sum of the measures of the angles of $\triangle ABC$.

3 (5.1.3) Let $A = (5, 1)$, $B = (8, 4)$, and $C = (1, 3)$ be points in the Poincaré Plane $\mathcal{H}$. Sketch $\triangle ABC$ and find the sum of the measures of the angles of $\triangle ABC$.

4 (5.3.1) Prove that any two right angles in a protractor geometry are congruent.

5 (5.3.2) Prove that in a protractor geometry, if A and D lie on opposite sides of $\overleftrightarrow{BC}$ and if $m(\angle ABC) + m(\angle CBD) = 180$, then A—B—D and the angles form a linear pair.

6 (5.3.11) In $\mathcal{H}$ find the angle bisector of $\angle ABC$ if $A = (0, 5)$, $B = (0, 3)$, and $C = (2, \sqrt{21})$. Sketch this situation.

7 (5.3.12) In $\mathcal{H}$ find the angle bisector of $\angle ABC$ if $A = (1, 3)$, $B = (1, \sqrt{3})$, and $C = (\sqrt{3}, 1)$. Sketch this situation.

8 (5.3.16) In the Taxicab Plane let $A = (0, 2)$, $B = (0, 0)$, $C = (2, 0)$, $Q = (-2, 1)$, $R = (-1, 0)$, and $S = (0, 1)$. Show that $\overline{AB} \simeq \overline{QR}$, $\angle ABC \simeq \angle QRS$, and $\overline{BC} \simeq \overline{RS}$. Is $\overline{AC} \simeq \overline{QS}$?