

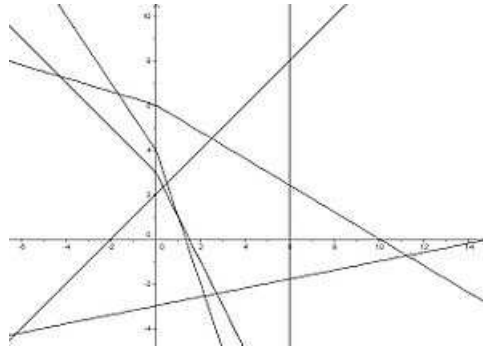
Mathematics 3260H – Geometry II: Projective and non-Euclidean geometry
TRENT UNIVERSITY, Winter 2015

Assignment #21 = 13 + 8*

The Moulton plane

Due on Thursday, 12 March, 2015.

Recall from class that the *Moulton plane* is the affine plane obtained from the Cartesian plane by replacing straight lines with negative slope by lines which bend to double the slope as they cross the y -axis from left to right.



More formally:

- The points of the Moulton plane are the points of the Cartesian plane \mathbb{R}^2 .
- The lines of the Moulton plane include:
 - The vertical lines of the Cartesian plane, *i.e.* $x = c$ for each $c \in \mathbb{R}$.
 - The lines of non-negative slope of the Cartesian plane, *i.e.* $y = mx + b$ for $m, b \in \mathbb{R}$ with $m \geq 0$.
 - The bent lines given by $y = \begin{cases} mx + b & x \leq 0 \\ 2mx + b & x \geq 0 \end{cases}$ for $m, b \in \mathbb{R}$ with $m \leq 0$.

A point is incident with a line in the Moulton plane if its coordinates satisfy the equation of the line.

1. Verify that the Moulton plane is indeed an affine plane. [10]

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