

Mathematics 3260H – Geometry II: Projective and Non-Euclidean Geometry
TRENT UNIVERSITY, Fall 2019

Assignment #6
Desargues' Theorem in the Fano Plane
Due on Thursday, 17 October.

Recall the following from Assignments #4 and #5:

DEFINITION. Two triangles ABC and DEF are said to be *in perspective from a point* P if AD , BE , and CF are all incident with P , and *in perspective from a line* ℓ if $AB \cap DE$, $BC \cap EF$, and $AE \cap DF$ are all incident with ℓ .

We can use this definition to conveniently state the following result:

DESARGUES' THEOREM. Two triangles are in perspective from some point if and only if they are in perspective from some line.

Finally, recall that the *Fano plane* or *Fano configuration* is the smallest projective plane, with a total seven points and seven lines.

1. Prove that Desargues' Theorem holds in the Fano plane. [10]