

Worksheet on Desargues' Theorem 2

Dr. Sarah's MAT 3610: Introduction to Geometry

goals:

- **IGS Exploration**
I can use Interactive Geometry Software (IGS) to discover relationships and demonstrate they seem to apply in a wide variety of examples.
- **Proof Considerations**
I can write rigorous proofs in geometry, identify underlying assumptions, and understand limitations and applications.
- **Geometric Perspectives**
I can compare and contrast multiple geometric perspectives.

Welcoming Environment: Keep it a safe place to express meaningful ideas and opinions. Actively listen to others and encourage everyone to participate. Part of the welcoming environment is to keep an open mind as you engage in our class activities, explore consensus and employ collective thinking across barriers. Maintain a professional tone, show respect and courtesy, and make your contributions matter.

1. Review the Desargues' theorem construction in Euclidean geometry with your group so that you'll be able to apply it. Write down one major takeaway in Euclidean geometry.
2. What happens to Desargues' theorem in projective geometry and spherical geometry? Discuss and then respond.
3. Open up
<https://www.geogebra.org/m/R5e9AggU>.
Set up Desargues theorem like you did previously in Euclidean geometry. In the order you will need them, you'll want to use **Hyperbolic Segment** (since there is no Hyperbolic polygon tool), **Point**, **Hyperbolic Segment**, **Hyperbolic Line**, and **Intersection of Hyperbolic Lines**. Aside from **Point** and **Move**, be sure to use the hyperbolic tools under the wrench symbol. What happens to Desargues' theorem in hyperbolic geometry?
4. Open
<https://www.geogebra.org/m/gqsbq9md>
and explore this by dragging L and then M . Summarize.
5. **Help each other and PDF responses to ASULearn:** If you are finished with the worksheet before I bring us back together, first ensure that your entire group is finished too, and if not, help each other. If your entire group is finished, then split up and pull up chairs so that you can discuss your responses with other groups. Collate your handwritten responses, preferably on this handout, into one full size multipage PDF for submission in the ASULearn assignment. I recommend you turn it in sometime today, but you have until the next class.