Creating a GSP Sketch to Connect Geometry and Algebra

1. Open a new GSP sketch. Select "Define Coordinate System" from the Graph menu.
2. Place two points, points C and D, on the x axis (where the x-values are less than zero)
3. Create segment CD.
4. Place a point anywhere on segment CD, and label it point E.
5. Construct a line perpendicular to segment CD that passes through point E.
6. Place a point anywhere along the perpendicular. Label the point F.
7. Construct segments CF and segments DF.
8. Construct polygon interior of triangle CDF.
9. Drag point F. Describe what changes and what remains the same.

10. We can look at how the area changes as a function of the height of the triangle, graphically, using GSP.
11. Measure the height of the triangle
12. Measure the area of the triangle
13. Drag point F and notice how the area of the triangle changes as the height changes.
14. Envision a scatterplot of several data points of (height, area).
15. Select the measure of height and select the measure of area. Choose "Plot as x-y" from the Graph menu. Point G should appear in the first quadrant of the graph. Discuss how the scale and graph should be adjusted.
16. Drag point F and notice the path that point G follows.
17. Select point G and choose "Trace Point" from the Display menu. Drag F again. What do you notice about the path?

18. Rather than drag the point we can view the path of G as F is animated along the perpendicular. Select point F and the perpendicular line. Choose "Action Button" >"Animation" from the "Edit" menu.
19. Select the appropriate pull down menus. Double click the animate button.
20. How can we describe the line that appears to be created by the path of point G?

21. Determine the equation of the line. How are the slope and the y-intercept related to the geometrical situation?