**Activity 5.7.1b Exploring the Parabola as a Locus of Points**

Open the file ctcoregeomACT571.ggb.

1. What is special about the two circles?

2. Grab point *D* and move it along line $\overbar{AB}$. What do you notice about the circles?

3. What do you notice about point *F*?

4. Right click (control-click on a Mac) on point *P* and turn the trace feature on. What happens as we move point *D*?

5. Right-click on point P and turn off the trace feature. Now move *F* to another location farther away from line $\overleftrightarrow{AB}.$

6. Right-click on point *P* and turn the trace feature back on. Again move point *D* along line $\overleftrightarrow{AB}$ Compare and contrast the figures formed by the first trace and the second trace.

7. What geometric theorems were used to construct this document? (Hint: In the Algebra window click on open circles to display angles alpha ($α)$ and beta ($β)$, line *d*, and segment *c*.)

For Your Information: If you want to continue to experiment with this file you can erase the traces you have already created by selecting “Refresh Views” under the View menu.

8. In both experiments, what can you say about the distances from *P* to *F* and from *P* to line $\overleftrightarrow{AB}$?

9. What is the name of the figure formed by the trace? (You may have seen this in an algebra course.)

10. Point *F* is called the **focus**. Line $\overleftrightarrow{AB}$ is called the **directrix**.

Use your observation to help complete the following definition:

A is the locus of points in a plane that are from a fixed (called the ) and a given line (called the ).