

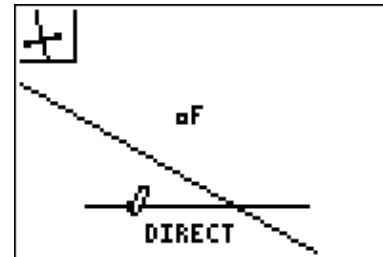


Problem 1 – Constructing a Parabola

A parabola is a set of all points equidistant from a point (called the focus) and a line (called the directrix). In this activity, you will use this definition to construct a parabola.

Start the *Cabri™ Jr.* application by pressing the [APPS] key and selecting **Cabri™ Jr.** Open the file *PARAB* by pressing [Y=], selecting **Open...**, and selecting the file. Follow the steps given to create a parabola using the focus and directrix.

Step 1 Construct the perpendicular bisector of the focus and the point on the directrix. Select the Perpendicular bisector command by pressing [ZOOM] and selecting **Perp. Bis.** Now, use the arrow keys to move to point *F*, press [ENTER] to select it, and move on to the point on the directrix and select it as well.



Note: To avoid confusion between which object to select, the object will appear to flash when it is going to be selected.

Step 2 Construct a perpendicular line from the point on the directrix to the directrix itself by pressing [ZOOM], selecting **Perp.**, and then selecting the point and then the directrix.

According to the earlier stated definition of the parabola, the intersection of these two lines is on the parabola.

Step 3 Display the intersection of these lines. Press [WINDOW], select **Point**, select **Intersection**, and then select the two lines.

Step 4 Hide both perpendicular lines by pressing [GRAPH], selecting **Hide/Show**, and choosing **Object**. Now, just select the two perpendicular lines.

Step 5 To display a greater number of the points from the parabola, press [ZOOM], choose **Locus**, and then choose the parabola point, then the point on the directrix.

Extension – Exploring the Parabola

In the extension, you will move the focus and explore the resulting changes in the shape of the parabola.

1. What happens to the parabola as the focus moves closer to the directrix?
2. What happens to the parabola when the focus is below the directrix?
3. What happens to the parabola if the focus is moved left or right?