

4-23-03
ALGEBRA

"GEOMETER'S SKETCHPAD" by
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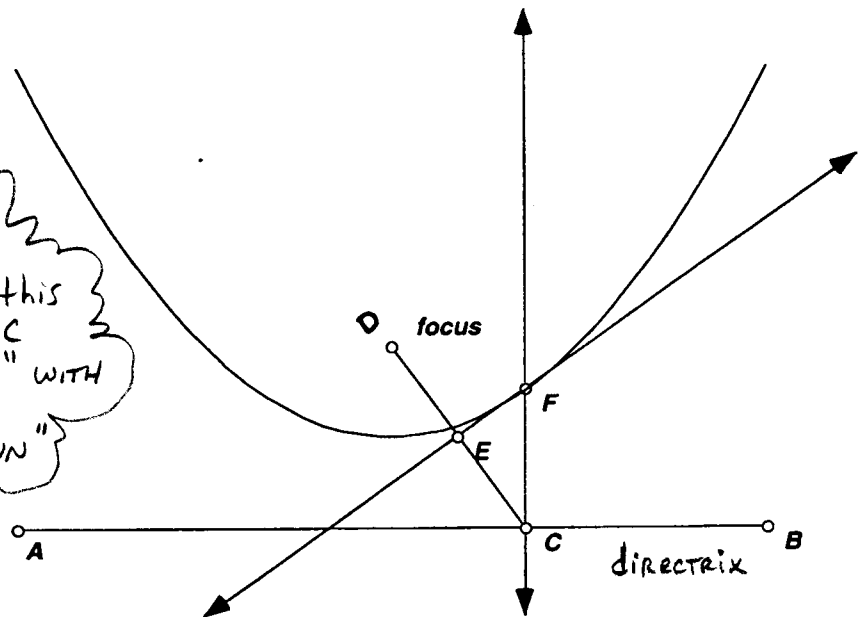
Construction: A Parabola

A parabola is a curve made up of points equidistant from a fixed point, called the *focus*, and a fixed line, called the *directrix*. In this investigation, you'll construct a parabola and investigate some of its properties.

Sketch

- Step 1: Construct a horizontal segment \overline{AB} point C on \overline{AB} .
- Step 2: Construct \overline{DC} , where D is above, but not directly above, C. Edit D's label to read "focus."
- Step 3: Construct E, the midpoint of segment focus-C, and a line through E perpendicular to segment focus-C.
- Step 4: Construct a line through C perpendicular to \overline{AB} .
- Step 5: Construct F, the intersection of these lines. F is equidistant from *focus* and \overline{AB} . (Why?)
- Step 6: Hide the lines, segment focus-C, \overline{AB} , and E.
- Step 7: Select F, then C, then choose Locus in the Construct menu.

- ① At our "worksheet" page on the web download the demo program
FILE = "gsp310dw.exe"
- ② Run the downloaded file, this will create a folder on your C drive NAMED "gsp4alg2" WITH 84 small files in it.
- ③ Go to the folder and "RUN" "GSKETCHD.EXE"
- ④ Do this worksheet) EXPLORE!



Investigate

You constructed a point that was equidistant from a fixed point (which you named *focus*) and a directrix line (actually a segment, \overline{AB}).

So the distance from the focus to point F is always equal to the distance of a perpendicular line from F to the line AB (the directrix). You will find out in geometry this is because we have constructed the triangle focus-F-E to always equal (be congruent to) triangle F-C-E.

This should be easier to see than my attempt to show this on the board :-) Mr. C. 4/22/03.

NOTE: this parabola is ONLY "PART" of a parabola because the directrix is just a line segment INSTEAD OF A LINE (WHICH would extend to ∞ in both directions).