Parabola Construction

TIMATH.COM: ALGEBRA 2

TEACHER NOTES

ID: 12552

Activity Overview

In this activity, students will construct a parabola using the focus and directrix definition. An extension problem has students explore how the location of the focus with respect to the directrix affects the shape of the parabola.

Topic: Quadratic Functions

- Geometric Definition of Parabola
- Locus
- Midpoint, Perpendicular Lines

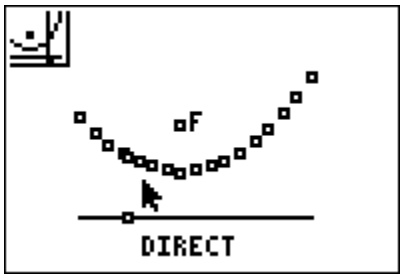
Teacher Preparation and Notes

- Students are given the focus and directrix and must construct the parabola. Students should be familiar with constructing perpendicular lines and using the **Locus** tool to complete this activity.
- The extension activity may be used as a separate exploration rather than as part of the first activity.
- **To download the student worksheet and Cabri™ Jr. files, go to education.ti.com/exchange and enter "12552" in the keyword search box.**

Suggested Related Activities

To download any activity listed, go to education.ti.com/exchange and enter the number in the keyword search box.

- Exploring the Parabola (TI-84 Plus family) — 10036
- Properties of Parabolas (TI-84 Plus family) — 8854



This activity includes screen captures taken from the TI-84 Plus Silver Edition. It is also appropriate for use with the TI-83 Plus and TI-84 Plus but slight variances may be found within the directions.

Compatible Devices:

- TI-84 Plus Family

Software Application:

- Cabri™ Jr.

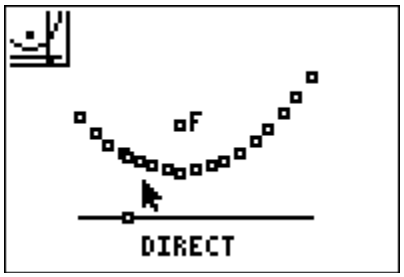
Associated Materials:

- ParabolaConstruction_Student.pdf
- ParabolaConstruction_Student.doc
- PARAB.8xv
- COMPLETE.8xv

Click HERE for Graphing Calculator Tutorials.

Problem 1 – Constructing a Parabola

Students will follow the directions given on the worksheet to construct the parabola from the focus and directrix definition.

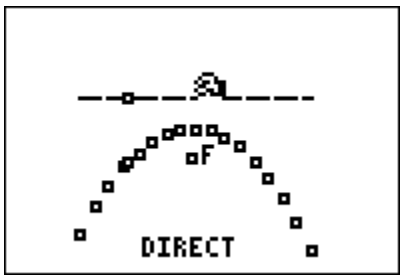


Discussion Question

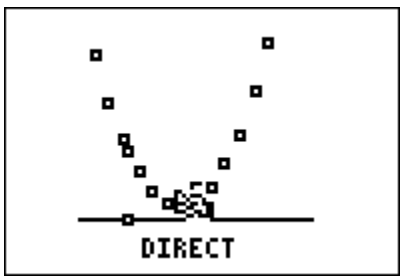
- *Why are two perpendicular lines used to find the point that traces the parabola?*
- *What do you notice about the distance between the point on the parabola and the focus and the distance between the point on the parabola and the point on the directrix?*

Extension – Exploring the Parabola

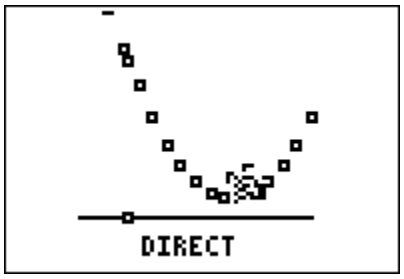
Students will use the figure they constructed in the previous section. If students are having trouble with constructing the figure, then send them the file *COMPLETE.8xv*, which contains the constructed figure for use during this part of the activity.



They will explore what happens to the shape of the parabola when the focus and the directrix are moved.



Students will then answer questions about their exploration.



1. The parabola gets narrower.
2. The parabola opens downward.
3. The vertex of the parabola moves in the same direction the focus is moved.