Roots of Radical Equations

ID: 12214

Time required
15–20 minutes

Activity Overview

In this activity, students will solve radical equations graphically. Several square and cubic root equations are given for students to graph and find intersections with the x-axis. Students will also use the distance formula to solve an extension problem.

Topic: Radical Equations

- *Roots*
- *Graphing*
- *Distance formula*

Teacher Preparation and Notes

- *Students should know how to, graph functions.*
- *For the extension problem, students will need to use the distance formula.*
- ***To download the student and worksheet, go to education.ti.com/exchange and enter "12214" in the keyword search box.***

Associated Materials

- *RootsOfRadicalEquations_Student.doc*

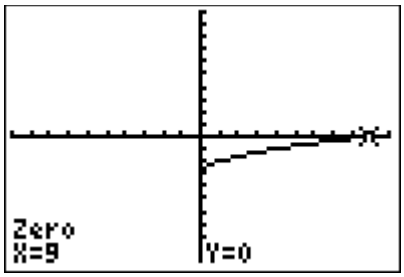
Suggested Related Activities

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

- *Radical Transformations (TI-84 Plus family) — 11574*
- *Radical Functions (TI-84 Plus family) — 8977*
- *Solving Equations with Two Radicals (TI-Nspire CAS technology) — 8625*

Problem 1 – Square Roots

In this problem, students will graph the square root function. Students will then find the zeros of the equation—if there are any. Students may have to change the window to find the intersection points with the *x*-axis.

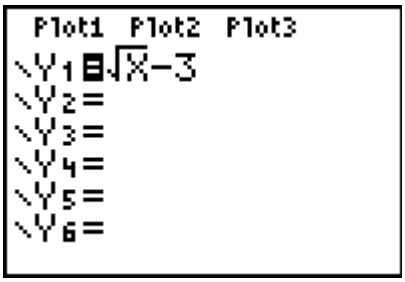


Discussion Questions

- What are the characteristics of an equation that crossed the *x*-axis? What are the characteristics of an equation that did not cross the *x*-axis? Why?
- What do you notice about graphs with a negative in front of the radical versus without a negative?

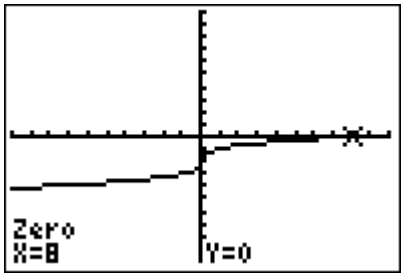
If using Mathprint OS:

When entering the function in Y1 and students press 2nd [√], the cursor will move under the radical sign. Students should enter the value of the radicand and then press ▶ to move out from under the radical sign.



Problem 2 – Cubic Roots

In this problem, students will graph the cubic root function. Students will then find the zeros of the equation—if there are any. Students may have to change the window to find the intersection points with the *x*-axis.

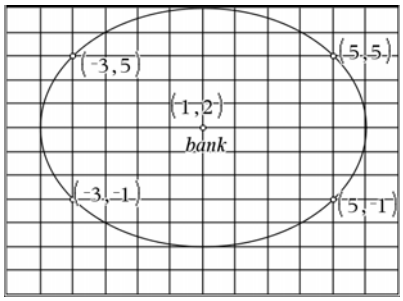


Discussion Questions

- What are the characteristics of an equation that crossed the *x*-axis? What are the characteristics of an equation that did not cross the *x*-axis? Why?
- What do you notice about graphs with a negative in front of the radical versus without a negative?

Application – Locating ATMs

In this problem, students must use the distance formula to find 8 integer locations of an ATM from a bank given as a point on the coordinate plane. The scenario is described and shown as a graph, and then the questions are asked. Students should set up a distance formula equation for each question before plotting any points on the graph to solve the problems and find the other value of the coordinate point to place the ATM. All answers should be integer values.



You may wish to draw a circle with radius 5 around the bank to explain why there are two solutions for each given direction.

Another option is to have students write an equation that represents any location of the ATM or bank in order to help students with the equation and then fill in the appropriate information.

Discussion Questions

- What formula can we use to find the location of each ATM?
- What information are we given for each problem to fill into the distance formula?
- Why are there two possible locations for each given direction?