DOINGWHATWORKS

SAMPLE MATERIAL

Properties of Parabolas

Twin Groves Middle School, Illinois

Topic: National Math Panel: Major Topics of School Algebra

Practice: Topics of Algebra

Teacher Wendy Loeb uses this lesson plan with her eighth-grade students. The goal of the lesson is for students to learn to graph quadratic equations in standard form and find minimum and maximum values. The lesson plan includes the specific examples that Loeb will use for step-by-step demonstration for the class, along with examples for guided practice, partner independent practice, and application. The lesson provides practice in finding minimum and maximum values by hand and also using a graphing calculator.

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8th Grade Algebra Lesson Plan
Properties of Parabolas

Objectives:

1) To graph quadratic functions in standard form
2) To find the maximum and minimum values of quadratic functions

Examples:

1) Find the vertex and graph the parabola: $y = x^2 - 4x + 3$
   - Teacher helps guide students through the problem by using the part of the quadratic formula for finding the vertex:

     $-\frac{b}{2a}$, and making a table of values to find other points.

2) Find the vertex and graph the parabola: $y = -2x^2 - 8x - 5$.
   - Students try this problem on their own, and put their answers on a graphing white board so the teacher can easily check the answer while walking around the room.

Real World Connection

3) Teacher directs students to example 4 on p. 247 in their text. Teacher and students read through the problem together, and the students do the same problem on their calculator while the teacher demonstrates.
4) Students then do another problem with a partner that is similar to this problem.
   - Example: The number of widgets the Woodget Company sells can be modeled by -5p + 100, where p is the price of a widget. What price will maximize revenue? What is the maximum revenue? (Quick Check #4 on p. 247 in text)
   - Students show their work on the white boards, and students discuss the answers as a group.

Lesson Conclusion

5) Discussion of how to determine whether a quadratic function has a minimum or maximum, how to find it both by hand and with a calculator, and how it is useful in a real world situation.
6) Homework is then assigned to practice the lesson.