Suggested Timing
80 min

Tools
• graphing calculators
• grid paper

Related Resources
BLM 8.CP.1 Chapter 8 Problem
    Wrap-Up Rubric
BLM G1 Grid Paper

Summative Assessment

Use **BLM 8.CP.1 Chapter 8 Problem
Wrap-Up Rubric** to assess student
achievement.

Accommodations

ESL—Encourage students to work with
a partner to assist with understanding
the language of the problem.

Motor—Have students work with a
partner to enter the data on a graphing
calculator.

Teaching Suggestions
• For part a), students should find possible whole number dimensions of a
  rectangle with perimeter 80 m, then find the area of each rectangle.
• Encourage students to record the dimensions and areas in a table.
• You may wish to have students use graphing calculators to graph the
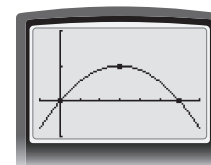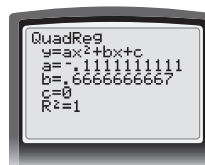 width versus area, and then have them find the maximum value and the
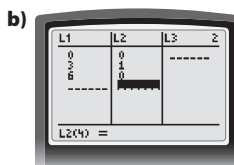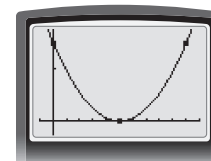 value at which the maximum value occurs.

Level 3 Sample Response
a)

Length (m)	Width (m)	Area (m^2)
35	5	175
30	10	300
25	15	375
20	20	400
15	25	375
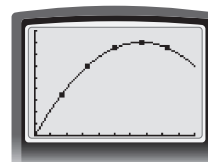
The arena will have the greatest area if it is a square with side length 20 m.

b)

The equation that models the shape of the ramp is $y = -0.111x^2 + 0.667x$.

c)
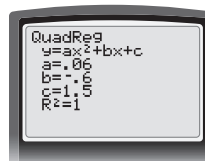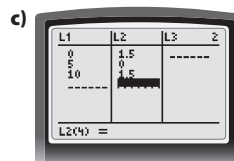
The equation that models the shape of the ramp is $y = 0.06x^2 - 0.6x + 1.5$.

Level 3 Notes
Look for the following:
• Finds the greatest possible area by completing a table of values or by
  plotting a few ordered pairs of possible dimensions for the rectangle on
  a graphing calculator, finding the equation of the parabola of best fit,
  then finding the maximum
• Recognizes that a square produces the maximum area for a given
  perimeter from previous exercises
• Solves equation to find the measure of the side of the square using the
  perimeter formula for a square
• For parts b) and c), uses a graphing calculator to find the equation of the
 parabola of best fit

What Distinguishes Level 2
At this level, look for the following:
• Requires assistance in completing a table of values
• Uses a graphing calculator to plot the data and find the equation
• Requires assistance in inputting the data into the graphing calculator
  and being able to use the QuadReg feature to find the equations for
  the ramps

What Distinguishes Level 4

At this level, look for the following:

- A developed and solved equation that arrives at the greatest possible area without using a table of values
- A diagram showing the dimensions of the rectangle

$$40 - x$$

x ▭
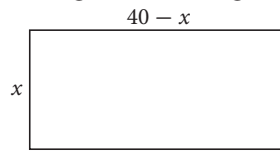
- A developed equation from data provided for both ramps