Chapter 1 Review

Accommodations ⊙

Motor–provide students with copies of **BLM G-5 Second Differences Tables**; encourage the use of technology for graphing

Ongoing Assessment ⊙

• Upon completing the Chapter 1 Review, students can also answer questions such as the following:
  – What questions did you find easy? Difficult? Why?
  – How often did you have to check the related worked example in the textbook to help you with the questions? For which questions?
• You may wish ask students to complete a copy of **BLM A-13 Self-Assessment Recording Sheet** to assist you in assessing your students.

Using the Chapter Review

• Discuss the technology that has been used throughout the chapter. Make this technology available to students as they work on the Review questions. Specify what technology will be available to them in future tests.
• This Chapter Review is organized by sections and is designed to review different skills and concepts in this chapter.
• Students might work independently to complete the Review, then in pairs to compare solutions.
• Alternatively, the Review could be assigned for reinforcing skills and concepts in preparation for the Practice Test. Provide an opportunity for the students to discuss any questions containing strategies or questions with features that they find difficult.
• After students have completed this Chapter Review, encourage them to make a list of questions that caused them difficulty, and include the related sections and teaching examples. They can use this to focus their studying for a final test on the chapter's content.
• Use **BLM 1–13 Chapter 1 Review** for extra review.

Using the Chapter Problem

- The chapter problem wrap-up involves a situation similar to the one used throughout the chapter. For parts a) and b), refer to Section 1.3. Part c) can be approached in a number of different ways. Encourage students to describe more than one method, at least one of which involves the use of technology. For part d), refer to Section 1.6.
- You may want to ask students to write the domain and range, and explain whether the graph of the function would be a continuous curve or a finite set of points.

Level 3 Notes

- Student creates a table of first differences and explains that the constant difference between consecutive revenues determines a quadratic function.
- Student finds the values of a, b, and c for the equation in the form $y = ax^2 + bx + c$.
- Student identifies the point where the revenue changes from increasing to decreasing to find the coordinates of the vertex.
- Student uses the coordinates of the vertex for values of h and k in the equation of the form $y = a(x - h)^2 + k$ and uses the value of a from part b) to get the equation in vertex form.
- Student makes no errors in calculations.

Level 3 Sample Response

a) Set up a table to calculate the first differences for the revenue.

Ticket Price ($)	Revenue ($)	First Differences
3	3600	
		800
4	4400	
		600
5	5000	
		400
6	5400	
		200
7	5600	
		0
8	5600	
		−200
9	5400	
		−400
10	5000	

If first differences form a linear pattern, there is a constant difference between consecutive revenues. The second differences will be constant and this determines if the relation is a quadratic function.

b) Enter the values of ticket price and revenue into lists L1 and L2. Then, use **QuadReg** to find the values of a, b, and c for the equation $y = ax^2 + bx + c$. Since $a = -100$, $b = 1500$, and $c = 0$ the equation is $y = -100x^2 + 1500x$.

c) In the table of values, the point where the revenue changes from increasing to decreasing is the maximum point, or the vertex. This maximum value occurs at $x = 7.5$. Substitute $x = 7.5$ into the equation $y = -100x^2 + 1500x$,

$y = -100 (7.5)^2 + 1500(7.5)$

$y = -5625 + 11\ 250$

$y = 5625$

The vertex is at $(7.5, 5625)$.

d) The vertex gives the value of h and k in the equation $y = a(x - h)^2 + k$. Since $a = -100$, the equation $y = -100x^2 + 1500x$ is the same as $y = -100(x - 7.5)^2 + 5625$.

What Distinguishes Level 2

- Student explains without a table of first differences that the constant difference between consecutive revenues determines a quadratic function.
- Student needs assistance in using technology to find the values of a, b, and c for the equation in the form $y = ax^2 + bx + c$.
- Student identifies the vertex where the revenue is a maximum but is unable to explain how.
- Student uses the coordinates of the vertex for values of h and k in the equation of the form $y = a(x - h)^2 + k$ but is not sure how to find the value of a.
- Student makes a few errors in calculations.

What Distinguishes Level 4

- Student creates a table of first differences and clearly explains that the constant difference between consecutive revenues, which gives constant second differences, determines a quadratic function.
- Student finds the values of a, b, and c for the equation in the form $y = ax^2 + bx + c$ with a full description.
- Student uses a sketch of the graph of Revenue versus Ticket Price to identify the point where the revenue changes from increasing to decreasing to find the coordinates of the vertex.
- Student makes correct and well presented calculations