Making Connections With Rational Functions and Equations

Teaching Suggestions

• This section is a consolidation of the concepts developed in this chapter. **Examples 1** through **3** include applications to real-world situations, as well as incorporating problem solving and investigative skills to look at special cases, such as removable discontinuities (holes) and oblique (slant) asymptotes.

• **Example 1** requires the use of reasoning and connecting skills to determine the needed function and representing skills to graph this function. Communicating the effect of halving the distance from the source of sound will complete the question.

• According to the course expectations, for those types of functions not covered in Sections 3.1, 3.2, and 3.3, students need to be permitted to use technology as a graphing tool.

• Students should be required to provide fully documented solutions. They will often attempt to state that a solution is rejected without providing a rationale. Explain that nothing is obvious and that reasons are important and can be stated in words or symbolic mathematical language.

• In the exercise questions, encourage students to include multiple representations: numeric, algebraic, graphical, and sentence answers where applicable.

• **Question 8** is a good use of technology for the purpose of finding the equation of an oblique asymptote.

• **Question 12** allows students to select the appropriate technological tools to graph the two given functions. Reasoning and connecting skills will then be necessary to compare the rate of change at a specific time with the two functions and communicate the findings. Communicating skills will also be used to describe what occurs to the systolic pressure over the first 10 s.

• In **question 15**, students need to determine where the rate of change is positive.

• Use **BLM 3–7 Section 3.5 Practice** for remediation or extra practice.

DIFFERENTIATED INSTRUCTION

Use **think aloud** with Example 3, part b).

COMMON ERRORS

• Students often jump to the equation before understanding the meaning of the equation.

R_x Suggest that they rewrite the description of the equation in their own words, to list what is known and to state what is being looked for in the question.

• Students often provide incomplete solutions to problems.

R_x Encourage multiple representations of the solution. Also, suggest that they reread the question in order to confirm that their final answer matches the original question.

Communicate Your Understanding Responses (page 189)

C1. Answers may vary. Sample answer: When a rational function simplifies to a linear relationship, it is discontinuous at a point.

C2. As $v \to 112\sqrt{10}^{\,-}$, $h \to \pm\infty$.

Mathematical Process Expectations

Process Expectation	Selected Questions
Problem Solving	
Reasoning and Proving	1, 2, 5, 8, 12–15
Reflecting	14
Selecting Tools and Computational Strategies	1–6, 8–12, 14
Connecting	1–6, 8–13, 15
Representing	1, 2, 4–7, 9–12, 14
Communicating	2, 5, 7, 8, 12, 14