
Connections

The Chapter Problem

For the Chapter Problem, students examine the average hours of daylight per month for a community in the Far North and model the periodic nature of the situation. The first task for students is to sketch a scatter plot of the data and then draw the curve of best fit. They will discover that the graph is periodic and sinusoidal and must interpolate and extrapolate from the graph. They will also examine the properties of the graph and develop an algebraic model for the daylight function. Students should use graphing calculators, if possible.

This problem can be used on an ongoing basis as the chapter develops. Alternatively, the problem could be solved as an assignment after the entire unit has been taught. A blackline master listing all of the questions is provided at the end of the chapter. In addition, the answers/solutions to these questions are also provided.

Challenge 1

Students must find information about the average monthly temperature where they live by searching the Internet. They will need to organize the data and to model the situation in a variety of ways. This challenge should be straightforward for either Functions and Relations students or Functions students.

Challenge 2

This challenge, which asks students to construct a working model of a wave action pool, will be very demanding for most students. Both Functions and Relations students or Functions students should be able to research and build a physical model of a wave action pool. The strongest Functions and Relations students might develop an algebraic model for the entire length of the wave action pool after extensive research.

Web Challenge

You will find support for this Internet activity at www.math.nelson.com.

Use all three challenges as rich learning tasks, which may also provide opportunities for formative or summative assessment. (See also Assessment and Evaluation in this *Teacher Resource*.)

Getting Ready

This chart links the prior knowledge for the work of this chapter to the appropriate *Getting Ready* questions. If students have difficulty, use the associated *Review of Essential Skills and Knowledge* pages and the review sections of previous chapters for remediation.

Getting Ready Topic	Chapter Review	Review of Essential Skills and Knowledge
Solving Right Triangles Questions 1–6, text p. 406		The Trigonometry of Right Triangles text pp. 397–399
Sequences Question 7, text p. 407	Patterns of Growth: Sequences text pp. 98–100	Pattern Recognition text pp. 1–2
Transformations Questions 8 and 9, text p. 407	Introducing Functions text p. 296	Transformations of Quadratic Relations text pp. 215 and 216
Maximum and Minimum Values and Zeros of Quadratic Functions Question 10, text p. 407	Quadratic Functions and Rational Expressions text pp. 377–380	Quadratic Relations in Standard Form Quadratic Relations in Vertex Form text pp. 210 and 211 Solving Quadratic Equations: The Quadratic Formula text pp. 213 and 214
Solving Linear Equations Question 11, text p. 407		Solving Linear and Quadratic Equations Algebraically text pp. 9 and 10