Chapter 7 Problem Wrap-Up

Student Text Pages
389

Suggested Timing
30–40 min

Tools
- grid paper
- protractor
- ruler

Technology Tools
- computer
- *The Geometer's Sketchpad*®

Related Resources
- G–4 Protractor
- T–4 *The Geometer's Sketchpad*® 3
- T–5 *The Geometer's Sketchpad*® 4
- BLM 7–1 Great North American Trigonometry Race Map
- BLM 7–16 Chapter 7 Problem Wrap-Up Rubric

Using the Chapter Problem

- Students will have determined some of the distances and directions while working on the components of the Chapter Problem. In the Wrap-Up they will need to find any remaining distances and directions.
- Assign question 11 in the Get Ready section on page 328. Students will likely need some review of the skills required to compute distances using a scale. Some may also need to review skills needed for making accurate measurements of lengths and angles on a small diagram such as the one provided in the textbook. Decide what level of accuracy will be acceptable. For example, angles could be specified to the nearest 3° and distances to the nearest 100 km.
- Use **BLM 7–1 Great North American Trigonometry Race Map** or **T–4 *The Geometer's Sketchpad*® 3** or **T–5 *The Geometer's Sketchpad*® 4** to support this activity.
- Encourage students to express angles in terms of bearings, making reference to north, south, east, and west.
- Suggest that students state any assumptions that must be made (e.g., average direction when travelling along a river, etc.).
- Students may be tempted to use the Internet as a source for distances and angles. Discourage this, except as a means of checking the accuracy of their by-hand work. In fact, Internet results should not match student work since distances are dependent on the map projection that is being used.
- Provide sufficient time for the revision process. Students will create higher quality work if they have an opportunity for constructive feedback and time to incorporate suggestions and additional ideas into their work. Encourage students to provide as complete an answer as possible to all parts of the question.
- As enrichment, explore the ideas of spherical trigonometry with the class. The laws of trigonometry done on a sphere like Earth are different from those of regular trigonometry, which is what the textbook explores. For example, the sides of triangles are not straight lines; they are arcs that form parts of great circles. Consequently, the sum of the angles in a triangle is more than 180° and this sum varies directly with the area of the triangle.
- Another source of enrichment is the connection between the geographical coordinates (latitude and longitude) and trigonometry. For example, Moosonee is located at 51°07'N, 80°35'W, while Regina is at 50°26'N, 104°40'W. How do you calculate the distance between these cities?

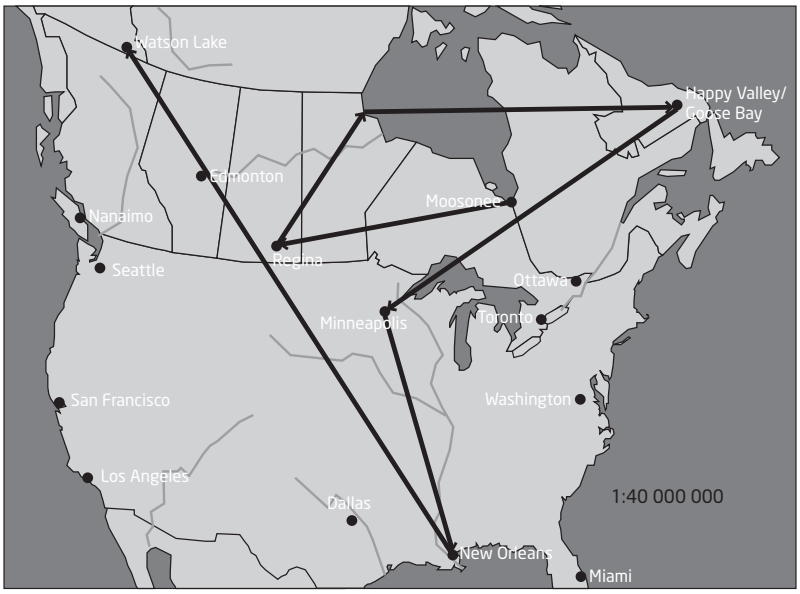
Summative Assessment

- Use **BLM 7–16 Chapter 7 Problem Wrap-Up Rubric** to assess student achievement.

Level 3 Sample Response

I started at Moosonee, ON and continued to the following cities:

- I travelled southwestward for 1678 km to Regina, SK.
- I turned to make a 45° angle in a northeastward direction and went 1142 km to Churchill, MB.
- I then turned making a 125° angle in an eastward direction and went 2157 km to Happy Valley/Goose Bay, NF.
- I next turned to make a 34° angle in a southwestward direction and went 2553 km to Minneapolis, MN.
- I then travelled southward 1695 km to New Orleans. The angle with my previous journey was 110°.
- For the last leg of the trip, I made a 19° angle and travelled in a northwestward direction 4413 km to Watson Lake, YK.



Note: The distances above were found using an Internet tool. Students' answers will vary since they will be using the scale map in the textbook or **BLM 7–1 Great North American Trigonometry Race Map**.

Level 3 Notes

Look for the following:

- Entire journey in a diagram and details about distances and angles
- Mostly correct algebraic calculations for ratios
- Algebraic steps with explanations
- Mention of potential sources of errors in accuracy of measurements

What Distinguishes Level 2

At this level, look for the following:

- Most of the journey in a diagram and partial details about distances and angles
- Algebraic calculations for ratios with some significant errors or omissions
- Algebraic steps with little or no explanation
- No mention of inaccuracy of measurements

What Distinguishes Level 4

At this level, look for the following:

- Entire journey in a well-detailed diagram and details about distances, angles, and geographically correct directions
- Correct algebraic calculations for ratios
- Detailed explanations for all steps, algebraic or otherwise
- A comprehensive discussion of the potential sources of errors in accuracy of measurements