1.3 The Sine Law

Student Text Pages
24–33

Suggested Timing
70 min

Tools
- *The Geometer's Sketchpad®*
- computers
- calculators

Related Resources
BLM 1-6 Section 1.3 The Sine Law Triangles
BLM 1-7 Section 1.3 The Sine Law
BLM 1-8 Section 1.3 Achievement Check Rubric
BLM T-2 *The Geometer's Sketchpad® 3*
BLM T-3 *The Geometer's Sketchpad® 4*

Link to Prerequisite Skills

Students should complete Prerequisite Skills questions 6, 8, and 10 before proceeding with this section.

Warm-Up

1. Find the angle measure to the nearest degree.

a) $\sin A = 0.3456$ **b)** $\sin B = 0.6754$ **c)** $\sin C = \frac{13}{22}$

2. Find the sine value for each angle to four decimal places.

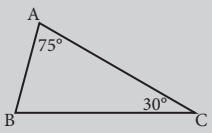
a) $\sin 55°$ **b)** $\sin 35°$

3. Solve for x. Round your answers to the nearest tenth.

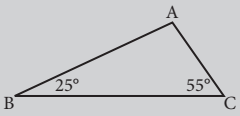
a) $\frac{x}{14} = \frac{7}{28}$ **b)** $\frac{20}{13} = \frac{15}{x}$

4. List the sides in order from shortest to longest.

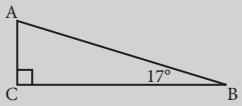
a)



b)



c)



Warm-Up Answers

1. a) 20° **b)** 42° **c)** 36°

2. a) 0.8192 **b)** 0.5736

3. a) 3.5 **b)** 9.75

4. a) AB, BC, AC (AC = BC) **b)** AC, AB, BC **c)** AC, BC, AB

Teaching Suggestions

Warm-Up

- Write the Warm-Up questions on the board or on an overhead. Have students complete the questions independently. Then, discuss the solutions as a class.

Section Opener

- Find out more about the Leaning Tower of Pisa. How was it constructed? Why is it leaning? When did it start to lean? Will it eventually fall? Which famous astronomer and physicist is associated with the tower? Use the Internet to find more information about the tower.

Investigate

- Have students work in pairs to complete the Investigate and discuss their results.
- Use **BLM 1-6 Section 1.3 The Sine Law Triangles** if *The Geometer's Sketchpad®* is not available. Follow the same procedure as in the text. Students will need pencils, grid paper, rulers, and protractors.

Investigate Answers (pages 24–25)

3. The ratios are equal.
4. The ratios are equal.
5. The ratios are equal.
6. Yes
7. 1; it is the same as the sine ratio.

Examples

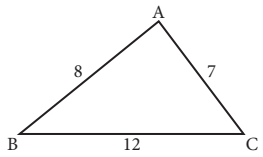
- Have students work through the Examples as a class before proceeding to the Discuss the Concepts.
- Ensure students understand they need the measures of two angles and one side or one angle and two sides (provided one side is opposite the given angle) to use the sine law.

Key Concepts

- Make a mind map for the sine law.

Discuss the Concepts

- For **question D1**, have students use this diagram to help them. Have them write the proportion for the sine law, $\frac{\sin A}{12} = \frac{\sin B}{7} = \frac{\sin C}{8}$, and see if they can use any two ratios to find the value of the third ratio.



- For **question D2**, have the students work at the board. Have one student in each pair demonstrate their solution to the class.

Discuss the Concepts Suggested Answers (page 31)

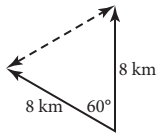
D1. No. Need to know the measure of at least one angle.
D2. Answers may vary.

Practise (A)

- Encourage students to refer to the Investigate and the Examples before asking for assistance.
- Students can work in small groups or pairs. Some students can work in pairs at the board and explain their solutions to the class.

Apply (B)

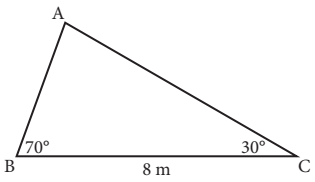
- **Question 6** links to the Chapter Problem. Remind students to keep the solution to this question handy as the methods they used may help them with the Chapter Problem Wrap-Up. The question can be modified so that the second pair heads 60° west of north to make the triangle isosceles. (The other angles are both 65°.)



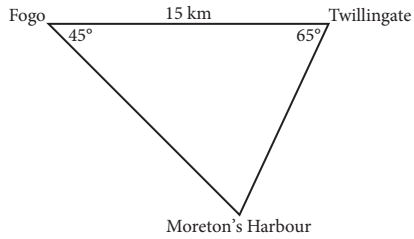
- **Question 7** is a Literacy Connect. You may wish to assign this question as a journal entry or to discuss the question as a class.

- Supply students with these diagrams for **questions 8** and **9** if they need assistance.

8.



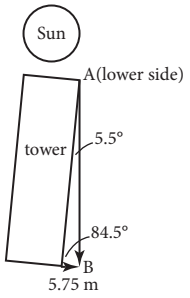
9.



- **Question 10** is an Achievement Check question. You may wish to use **BLM 1-8 Section 1.3 Achievement Check Rubric** to assist you in assessing your students.

Extend (C)

- Assign the Extend questions to students who are not being challenged by the questions in Apply.
- Students can work in pairs.
- Supply students with this diagram for **question 11** if they need assistance.



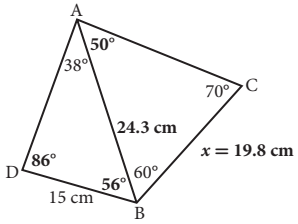
Use trigonometric ratio:

$$\tan 84.5° = \frac{\text{height of tower on lower side}}{5.75}$$

Use sine law:

$$\frac{\text{height of tower on lower side}}{\sin 84.5} = \frac{5.75}{\sin 5.5}$$

- For **question 13**, provide students with steps for the solution if they need assistance.



  - Find the measure of the angle across from x using the sum of the angles of a triangle.
  - Use the sine law to find the missing angle of 56°.
  - Determine the measure of the 86° angle using the sum of the angles in a triangle.
  - Find side AB using the sine law.
  - Use the sine law to find x.

Achievement Check Answers (page 33)

10. $4273

Mathematical Process Expectations

Process Expectation	Questions
Problem Solving	6, 8, 9, 12, 13
Reasoning and Proving	7
Reflecting	9
Selecting Tools and Computational Strategies	1–6, 8–13
Connecting	9, 11, 12
Representing	4, 6, 10, 12
Communicating	7

Extra Practice

- You may wish to use **BLM 1-7 Section 1.3 The Sine Law** for remediation or extra practice.