Right Triangle Trigonometry

3

General Outcome

Develop spatial sense and proportional reasoning.

Specific Outcome

M4 Develop and apply the primary trigonometric ratios (sine, cosine, tangent) to solve problems that involve right triangles.

By the end of this chapter, students will be able to

Section	Understanding Concepts, Skills, and Processes
3.1	✓ explain the relationships between similar triangles and the definition of the tangent ratio
	✓ identify the hypotenuse, opposite side, and adjacent side for a given acute angle in a right triangle
	✓ develop strategies for solving right triangles
	✓ solve problems involving one or more right triangles, using the tangent ratio
3.2	✓ use the sine ratio and cosine ratio to solve problems involving right triangles
	✓ solve problems that involve direct and indirect measurement
3.3	✓ explain the relationships between similar right triangles and the definitions of the trigonometric ratios
	✓ solve right triangles, with or without technology
	✓ solve problems involving one or more right triangles

Assessment	Supporting Learning
Assessment *as* Learning	
Use the Before column of **BLM 3–1 Chapter 3 Self-Assessment** to provide students with the big picture for this chapter and help them identify what they already know, understand, and can do. You may wish to have students keep this master in their math portfolio and refer back to it during the chapter.	• During work on the chapter, have students keep track of what they need to work on in the What I Need to Work On section of their Foldable. They can check off each item as they develop the skill or process at an appropriate level.
Assessment *for* Learning	
Method 1: Use the introduction on page 98 in *Mathematics 10* to activate student prior knowledge about the skills and processes that will be covered in this chapter. **Method 2:** Have students develop a journal entry to explain what they personally know about right triangles, the Pythagorean relationship, and trigonometry. You might provide the following prompts: • Where have you encountered the Pythagorean relationship? How was it used? • Have you ever had any experience with trigonometry? If so, when? • How do you think the Pythagorean relationship and trigonometry could be used in daily life and in different careers?	• Have students use the What I Need to Work On section of their Foldable to keep track of the skills and processes that need attention. They can check off each item as they develop the skill or process at an appropriate level. • Students who require activation of prerequisite skills may wish to complete **BLM 3–2 Chapter 3 Prerequisite Skills**. This material is on the Teacher CD of this Teacher's Resource and mounted on the www.mhrmath10.ca book site.
Assessment *as* Learning	
Chapter 3 Foldable As students work on each section in Chapter 3, have them keep track of any problems they are having in the What I Need to Work On section of their Foldable.	• As students complete each section, have them review the list of items they need to work on and check off any that have been handled. • Encourage students to write definitions for the Key Terms in their own words, including reminder tips that may be helpful for review throughout the chapter.
Assessment *for* Learning	
BLM 3–3 Chapter 3 Warm-Up This reproducible master includes a warm-up to be used at the beginning of each section. Each warm-up provides a review of prerequisite skills needed for the section.	• As students complete questions, note which skills they are retaining and which ones may need additional reinforcement. • Use the warm-up to provide additional opportunities for students to demonstrate their understanding of the chapter material. • Have students share their strategies for completing math calculations.

Chapter 3 Planning Chart

Section/ Suggested Timing	Prerequisite Skills	Materials/Technology	Teacher's Resource Blackline Masters	Exercise Guide	Assessment		
					Assessment *as* Learning	Assessment *for* Learning	Assessment *of* Learning
Chapter Opener • 30–40 minutes (TR page 79)			BLM 3–1 Chapter 3 Self Assessment BLM 3–2 Chapter 3 Prerequisite Skills BLM U1–1 Unit 1 Project BLM U1–2 Unit 1 Project Checklist		TR page 78 Chapter 3 Foldable, TR page 78	TR page 78	
3.1 The Tangent Ratio • 120–140 minutes (TR page 81)	Students should be familiar with • right triangles • ratios • similar triangles • using their calculator	• grid paper • protractor • ruler	BLM 3–3 Chapter 3 Warm-Up BLM 3–4 Chapter 3 Unit 1 Project BLM 3–5 Section 3.1 Extra Practice BLM 3–6 Protractor	**Essential:** #1a), b), 2, 3a), 4a), b), 5, 6, 9, 17, 18, 20 **Typical:** #1, 3a)–c), 4a), b), 5–7, 9–13, 18–21 **Extension/Enrichment:** #10–21	TR pages 83, 87 Chapter 3 Foldable, TR page 78	TR pages 85, 86, 87	
3.2 The Sine and Cosine Ratios • 100–120 minutes (TR page 88)	Students should be familiar with • similar triangles • right triangles • labelling the sides of a triangle in relation to the reference angle • using their calculator to find trigonometic ratios and to find the reference angle	• protractor • ruler • calculator • 1 m of foam pipe insulation, cut lengthwise • marble or small steel ball • eight to ten thick books or bricks or a chair • masking tape • measuring tape • table	BLM 3–3 Chapter 3 Warm-Up BLM 3–7 Section 3.2 Extra Practice	**Essential:** #1a), c), e), 2a), c), 3a), b), e), f), 4a), 5, 6a)–c), 7, 8, 13 **Typical:** #1a), c), 2a), c)–e), 3a), b), e), f), 4a), 5, 6a)–c), 7, 8, 11, 13, 17 **Extension/Enrichment:** #10, 12–17	TR pages 89, 93 Chapter 3 Foldable, TR page 78	TR pages 91, 93	
3.3 Solving Right Triangles • 100–120 minutes (TR page 94)	Students should be familiar with • primary trigonometric ratios • Pythagorean relationship • problem solving strategies	• metre stick or measuring tape • masking tape • calculator	BLM 3–3 Chapter 3 Warm-Up BLM 3–4 Chapter 3 Unit 1 Project BLM 3–8 Section 3.3 Extra Practice	**Essential:** #1a), c), 2, 3, 4a), b), 5a), e), 6, 7, 11, 16 **Typical:** #1a)–c), 2, 3, 6, 7, 11, 12, 16 **Extension/Enrichment:** #9, 13, 14–16	TR pages 95, 99 Chapter 3 Foldable, TR page 78	TR pages 97, 99	
Chapter 3 Review • 60–90 minutes (TR page 100)		• ruler • protractor • calculator	BLM 3–5 Section 3.1 Extra Practice BLM 3–7 Section 3.2 Extra Practice BLM 3–8 Section 3.3 Extra Practice	Have students do at least one question related to any concept, skill, or process that has been giving them trouble.	Chapter 3 Foldable, TR page 78	TR page 100	
Chapter 3 Practice Test • 40–50 minutes (TR page 101)		• ruler • calculator	BLM 3–9 Chapter 3 Test	Provide students with the number of questions they can comfortably do in one class. Choose at least one question for each concept, skill, or process. **Minimum:** 1–4, 6–9	TR page 102		TR page 102 BLM 3–12 Chapter 3 Test
Unit 1 Project • 60–90 min (TR page 103)			Master 1 Project Rubric BLM U1–3 Project Final Report BLM 1–4 Chapter 1 Unit 1 Project BLM 2–5 Chapter 2 Unit 1 Project BLM 3–4 Chapter 3 Unit 1 Project				TR page 104 Master 1 Project Rubric
Unit 1 Review and Test • 60–90 min (TR page 105)		• ruler	BLM 1–10 Chapter 1 BLM Answers BLM 2–11 Chapter 2 BLM Answers BLM 3–10 Chapter 3 BLM Answers	Have students do at least one question related to any concept, skill, or process that has been giving them trouble.	Chapters 1, 2, and 3 Foldables	TR page 105	TR page 105