UNIT 2

Trigonometry

General Outcome

Develop trigonometric reasoning.

Specific Outcomes

T1 Demonstrate an understanding of angles in standard position, expressed in degrees and radians.

T2 Develop and apply the equation of the unit circle.

T3 Solve problems, using the six trigonometric ratios for angles expressed in radians and degrees.

T4 Graph and analyze the trigonometric functions sine, cosine and tangent to solve problems.

T5 Solve, algebraically and graphically, first and second degree trigonometric equations with the domain expressed in degrees and radians.

T6 Prove trigonometric identities, using:

- reciprocal identities
- quotient identities
- Pythagorean identities
- sum or difference identities (restricted to sine, cosine and tangent)
- double-angle identities (restricted to sine, cosine and tangent).

General Outcome

Develop algebraic and graphical reasoning through the study of relations.

Specific Outcomes

RF2 Demonstrate an understanding of the effects of horizontal and vertical translations on the graphs of functions and their related equations.

RF3 Demonstrate an understanding of the effects of horizontal and vertical stretches on the graphs of functions and their related equations.

RF4 Apply translations and stretches to the graphs and equations of functions.

***Pre-Calculus 12*, pages 162–163**

Suggested Timing
30–45 min

Blackline Masters
Master 1 Holistic Project Rubric
Master 2 Ana-Holistic Project Rubric
BLM U2–1 Unit 2 Project Checklist

What's Ahead

In Unit 2, students explore trigonometry and solving trigonometric problems. In Chapter 4, they are introduced to angles and their measurement, and the relationship between degree and radian measurement. They extend this knowledge to build an understanding of the unit circle and explore trigonometric relationships. The chapter finishes by introducing trigonometric equations. In Chapter 5, students extend their understanding of trigonometry with an introduction to trigonometric functions and graphs. They first explore the sine and cosine functions, and transformations of the sinusoidal functions. They then explore the tangent function, and finish the chapter using equations and graphs of trigonometric functions to solve problems. In the last chapter of the unit, chapter 6, students take a more in-depth look at trigonometric identities, including proofs.

Planning Notes

Begin the unit with a discussion of trigonometry. Read the opener on page 162 as a class and look at the pictures on the opening pages. Ask students

- What do you know about geometry and trigonometry? Where have you been introduced to these areas of study in the past?
- How do you think trigonometry might be used in the world around you? How might it be reflected in nature? How might it be used in different professions and careers? Do you think the study of trigonometry has any affect on your life?

Unit 2 Project

This unit project provides an opportunity for students to explore angle measurement, trigonometric equations, and trigonometric functions. They also can explore past and present applications of trigonometry.

In Chapter 4, students research the history of units of angle measure. In Chapter 5, they explore the application of periodic functions to the field of communications. In Chapter 6, they explore the use of trigonometric identities in Mach numbers.

At the end of the unit, students can choose to research the history and use of units of angle measure, explore periodic functions in electronic communication, apply their skills to supersonic travel, or explore the science of forensics through its application of trigonometry.

With the class, read and discuss the introductory notes for the Unit 2 Project. You may wish to point out the Project Corners throughout chapters 4, 5, and 6. These features are not mandatory but are recommended because they provide helpful information about the Unit 2 project. You may wish to provide students with **BLM U2–1 Unit 2 Project Checklist**. Students can use the checklist as they prepare their project. Have students collect all their work for the Unit 2 Project in a portfolio.

Students do best if they know exactly how they will be evaluated. One way to increase student motivation is to work with the class to create a specific rubric for the project. You may wish to use **Master 1 Holistic Project Rubric** as a template and review the general holistic points within the 1–5 scoring levels. Alternatively, you may wish to use **Master 2 Ana-Holistic Project Rubric** and decide whether you will score the work out of 5 or out of 20. See the Web Link below for a specific rubric in each style.

For additional information on the Unit 2 Project, see pages 163 and 325 in the student resource or pages 91, 145, and 163 in this Teacher's Resource.

Web Link

For a holistic rubric and an ana-holistic rubric related to the Unit 2 Project, go to www.mcgrawhill.ca/school/learningcentres and follow the links.