

5.5 Technology: TI-83 Plus Calculator: Graphing Trigonometric Functions

Specific Expectations

The following expectations are common to both the Functions and Relations course and the Functions course.

- TF2.07 demonstrate facility in the use of radian measure in solving equations and in graphing
- TF3.01 sketch the graphs of $y = \sin x$ and $y = \cos x$, and describe their periodic properties
- TF3.06 sketch the graph of $y = \tan x$; identify the period, domain, and range of the function; and explain the occurrence of asymptotes
- TF4.02 explain the relationship between the properties of a sinusoidal function and the parameters of its equation, within the context of an application, and over a restricted domain

Evidence of Learning

Students should be able to

- use the TI-83 Plus calculator to graph a simple trigonometric function in either degree measure or radian measure, over a restricted domain, and using a specific interval

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Time Required Functions and Relations or Functions: 30 min

Materials and Equipment

- TI-83 Plus calculator

Overview

- Select radian or degree mode (**MODE**).
- Set the appropriate domain and interval for the graph (**WINDOW**).
- Enter the trigonometric equation into the equation editor.
- Graph the function using **ZOOM** and **ZoomFit** or **ZoomTrig** (or **GRAPH**).

Management Options

Groups – If needed, ask pairs to share a graphing calculator. Each partner should work through the steps for graphing in degrees and for graphing in radians. For the *Practice*, partners can take turns using the calculator and do alternate questions. Have students discuss the steps before actually using the calculator. If a TI-83 view screen is available, take up the answers to each question by having different students demonstrate some or

all of the steps.

Independent Work – If possible, give one graphing calculator to each student and allow 15 to 20 minutes for students to complete the *Practice*. If there is a TI-83 view screen, take up the answers to the *Practice* questions. Have different students demonstrate different steps using the calculator.

TECHNOLOGY TIP

Students may also graph by using **GRAPH**; however, they must enter all of the parameters.

TEACHER INTERVENTION

Remind students that the maximum and minimum values of these sinusoidal functions are +1 and –1, respectively. But this situation will change. Generally, it is better to extend the scales of the y-axis a little beyond the range of the graph. Recommend setting **Ymax** to 2 and **Ymin** to 2 or **Ymin** to –2, or other appropriate values. Since pressing **ZOOM** and using **ZoomFit** automatically determines the best values to maximize the visual presentation, students may want to use **GRAPH** instead.

ASSESSMENT SUGGESTION

Communication

Have some students explain to the class how to use the calculator to do each of the *Practice* questions. Look for clear explanations and the correct use of mathematical vocabulary.

ASSESSING LEARNING SKILLS

Independence

If you assign this section for independent work in the classroom, circulate and observe who is accepting the responsibility of completing the task in the allotted time. If students have difficulty, do they ask others for help if they need to? Use the Generic Rubric for Independence and the Independence Self-Reflection Sheet.

Questions with a Functions and Relations:

Focus:

1

Questions with a Functions Focus:

1