

# Graphing Technology Lab

## Solving Trigonometric Equations

The graph of a trigonometric function is made up of points that represent all values that satisfy the function. To solve a trigonometric equation, you need to find all values of the variable that satisfy the equation. You can use TI-Nspire technology to solve trigonometric equations by graphing each side of the equation as a function and then locating the points of intersection.

### ACTIVITY 1 Real Solutions

Use a graphing calculator to solve  $\sin x = 0.4$  if  $0^\circ \leq x < 360^\circ$ .

**Step 1** Enter and graph related equations. Rewrite the equation as two equations,  $f_1(x) = \sin x$  and  $f_2(x) = 0.4$ . Then graph the two equations.

**KEYSTROKES:** 6: New Document 2: Add Graphs & Geometry  
 0.4

Because the interval is in degrees, set your calculator to degree mode.

**KEYSTROKES:** 8: System Info 3: Graphs & Geometry Settings

Then set the **Graphing Angle** setting to degrees. Use the to move the cursor down the screen. Set the viewing window.

**KEYSTROKES:** 4: Window 1: Window Settings 0 360   
90 1 1 0.1

**Step 2** Approximate the solutions. Based on the graph, you can see that there are two points of intersection in the interval  $0^\circ \leq x < 360^\circ$ . Use the **Intersection Point(s)** option to determine the  $x$ -values at which the two graphs intersect.

**KEYSTROKES:** 6: Points and Lines 3: Intersection Point(s)

Move the cursor to each function pressing after each.

The solutions are  $x \approx 23.57^\circ$  and  $x \approx 156.4^\circ$ .



