

Using this Chapter with Functions and Relations / Functions Courses

Functions and Relations (University)

Students in this course must be prepared for the abstract mathematical concepts of the Geometry and Discrete Mathematics course. These students will be required to broaden their skills in solving complex problems and to also think and compute more abstractly. To help prepare these students for this course, consider the following:

Wherever possible, increase the level of algebraic abstraction. For instance, give the solution to a trigonometric equation as $\frac{\pi}{2}(2n-1)$, $-1 \leq n \leq 2$, or $\frac{\pi}{2}(2n-1)$, $n \in \mathbf{I}$, rather than $-\frac{\pi}{2}, \frac{\pi}{2}, \frac{3\pi}{2}, \dots$

A number of questions require students to show that a condition holds true for a specific, finite domain. For instance, for $f(\theta) = \sin \theta$, show $f(\theta) = -f(-\theta)$ for $\theta = -270^\circ, -90^\circ, 90^\circ$, and 270° . Extend the question by asking students to *prove* that $f(\theta) = -f(-\theta)$, for all θ .

Functions (University/College)

Students in this course must be prepared to build on their experience with functions if they plan to take the Advanced Functions and Introductory Calculus course in grade 12. Note that these students will not encounter trigonometric functions in the calculus course. However, these students will use polynomial, rational, exponential, and logarithmic functions to model real-world problems in a range of applications. By the time they complete the grade 11 course, students' skills in using a graphing calculator should be highly developed. To help prepare these students for this course, consider the following:

Spend time helping students see the connection between the clockwise and counterclockwise rotation of a point about a circle and the associated trigonometric graphs. This connection is especially useful when students solve trigonometric equations, for example, $f(k\theta) = c$, which may have many solutions for a given domain. This activity will also help students connect an algebraic solution with the corresponding graph.

Once students have completed Section 5.5, which is about graphing trigonometric functions using the TI-83 Plus, encourage them to use the graphing calculator frequently to confirm a graph of a function and its properties. They should also use the calculator to confirm exact solutions of trigonometric equations for a specific domain.