Pre-Calculus

GOAL 1: The learner will describe geometric figures in the coordinate plane algebraically.

1.01 Transform relations in two dimensions; describe the results algebraically and geometrically.
1.02 Use the quadratic relations (parabola, circle, ellipse, hyperbola) to model and solve problems; justify results.
a) Solve using tables, graphs, and algebraic properties.
b) Interpret the constants and coefficients in the context of the problem.
1.03 Operate with vectors in two dimensions to model and solve problems.

GOAL 2: The learner will use relations and functions to solve problems.

2.01 Use functions (polynomial, power, rational, exponential, logarithmic, logistic, piecewise-defined, and greatest integer) to model and solve problems; justify results.
a) Solve using graphs and algebraic properties.
b) Interpret the constants, coefficients, and bases in the context of the problem.
2.02 Use trigonometric and inverse trigonometric functions to model and solve problems; justify results.
a) Solve using graphs and algebraic properties.
b) Create and identify transformations with respect to period, amplitude, and vertical and horizontal shifts.
c) Develop and use the law of sines and the law of cosines.
2.03 For sets of data, create and use calculator-generated models of linear, polynomial, exponential, trigonometric, power, logistic, and logarithmic functions.
a) Interpret the constants, coefficients, and bases in the context of the data.
b) Check models for goodness-of-fit; use the most appropriate model to draw conclusions or make predictions.
2.04 Use the composition and inverse of functions to model and solve problems.
2.05 Use polar equations to model and solve problems.
a) Solve using graphs and algebraic properties.
b) Interpret the constants and coefficients in the context of the problem.
2.06 Use parametric equations to model and solve problems.
2.07 Use recursively-defined functions to model and solve problems.
a) Find the sum of a finite sequence.
b) Find the sum of an infinite sequence.
c) Determine whether a given series converges or diverges.
d) Translate between recursive and explicit representations.
2.08 Explore the limit of a function graphically, numerically, and algebraically.