

# TEACHER MASTERY GUIDE

## ADVANCED ALGEBRA & TRIGONOMETRY

### FIRST TERM

#### Understanding Functions

- \* represent and analyze a variety of functions and their characteristics graphically, algebraically, verbally, and numerically;
- \* graph a variety of functions using transformations;
- \* solve a variety of equations using appropriate methods;
- \* solve linear, quadratic, and polynomial inequalities using appropriate methods;
- \* solve real-world problems modeled by linear, quadratic, radical, rational, polynomial, exponential, and logarithmic functions;
- \* use data analysis techniques to model real-world phenomena using functions.

#### Applications of Matrices

- \* demonstrate an understanding of operations on matrices;
- \* solve real-world problems involving networks, finite graphs, and geometric transformations.

#### Sequences and Series

- \* recognize the difference between continuous and discrete situations;
- \* demonstrate an understanding of recursive and explicit definitions of functions and sequences;
- \* apply sigma notation with arithmetic and geometric series;
- \* represent a sequence using a list, graph, symbols, and words.

#### Trigonometric Functions and Applications of Trigonometry

- use degrees and radians interchangeably to represent angle measure in problems and explain the advantages/disadvantages of a particular choice
- determine values of the trigonometric functions for special angles using the unit circle and the symmetry of the circle
- define the trigonometric functions using the unit circle
- graph the trigonometric functions
- understand amplitude, period, phase shift, and vertical shift and apply to graphing trigonometric functions
- model periodic phenomena using trigonometric functions with appropriate technology
- derive the Pythagorean Identities verify trigonometric identities graphically and by substitution
- solve trigonometric equations graphically
- solve real-world problems applying the trigonometric ratios, the Law of Sines, and Law of Cosines
- apply the trigonometric formulas for finding the area of triangles and circular sectors and segments