Exit Competencies for Trigonometry

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The following competencies are generally expected by all institutions:

1) Acquire geometric concepts of angle (e.g. initial side, terminal side, coterminal angles, degree, radian, central angle, circular arc length, circular sector area, and reference angle) and be able to apply appropriate properties.
2) Attain the concepts of the six trigonometric functions, both in terms of a unit circle and a right triangle, and be able to apply such knowledge.
3) Understand the inter-relationships among the six trigonometric functions, including the Pythagorean Identities, and be able to express one in terms of another appropriately.
4) Recall the graphs of the six trigonometric functions and be able to recognize and apply such knowledge (including incorporation of appropriate transformations: shifting, reflecting, stretching, and shrinking, and the knowledge of period, phase shift, and amplitude).
5) Understand the general nature of proving trigonometric identities and be able to perform such tasks appropriately.
6) Be able to solve trigonometric equations and clearly identify solutions.
7) Be familiar with useful formulas (e.g. addition and subtraction, double-angle, half-angle, product-to sum, sum-to-product, law of sines, law of cosines, and Heron's) and be able to use them effectively.
8) Attain the concepts and graphs of inverse trigonometric functions and their related properties, be able to perform appropriate operations and solve related equations.
9) Use trigonometry to model and solve basic applied problems.

The following competencies are based on the elective topics (vary from institution to institution):

1) Be familiar with the trigonometric form of complex numbers, understand its geometric interpretation, and be able to perform basic conversions.
2) Be able to perform the multiplication and division of complex numbers in trigonometric form and describe their respective geometric interpretation.
3) Apply De Moivre's Theorem to find roots of complex numbers and interpret geometrically.
4) Acquire the basic concepts and operations of two-dimensional vectors, and their geometric interpretation; understand the trigonometric aspect of the inner (dot) product and apply the knowledge to related problems.