

## Advanced Algebra and Trigonometry

<b>Text:</b>	Larson, Hostetler, & Edwards. <i>Precalculus with Limits: A Graphing Approach 3<sup>rd</sup> Edition</i> , Houghton Mifflin Company: New York.
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<b>Supplemental Materials:</b>	Study and Solutions Guide; Test Item File; Testing CD-ROM; TI-84 Plus Silver graphing calculator (Smartview emulator software)
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<b>Course Description:</b>	Advanced Algebra III and Trigonometry is a course that expands the concepts of functions from Algebra II and introduces trigonometry to prepare students for calculus. This course uses three approaches to problem situations: an algebraic approach, a numerical approach, and a graphic approach to investigate algebraic and transcendental concepts. Problem-solving situations provide all students an environment that promotes communication, engages student reasoning, and fosters connections within mathematics, to other disciplines, and to the real world. Students will use algebraic and trigonometric models to represent, explore, and develop abstract concepts. The use of appropriate technology will help students apply mathematics in an increasingly technological world. Students will be challenged through critical thinking models that will enable them to practice skills necessary for higher mathematics education.
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<b>Methods of Evaluation:</b>	Students can be evaluated through tests, quizzes, homework problems, lab grades, semester exams, and/or any other form of evaluation instrument the instructor finds applicable to the course.
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<b>Pace of Instruction:</b>	First Semester: P1-4.1, 9.1-9.7, Appendix B Second Semester: 4.2-8.5, 10.1-12.4
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<b>Course Objectives:</b>	At the end of this course students should be able to: <ol style="list-style-type: none"> <li>1. Solve equations and inequalities algebraically, numerically, and graphically.</li> <li>2. Solve and graph functions and any reflections, shifts, or stretches.</li> <li>3. Create combination functions and inverse function</li> <li>4. Solve quadratic equations algebraically and graphically.</li> <li>5. Solve higher degree polynomial functions algebraically and graphically.</li> <li>6. Find intercepts, zeros, and asymptotes of functions.</li> <li>7. Graph rational functions..</li> </ol>
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8. Solve for complex zeros.
9. Use sequences, series, and probability to predict outcomes.
10. Understand exponential and logarithmic functions and their graphs, and the real world applications of these transcendental functions.
11. Solving exponential and logarithmic functions.
12. Understand and use radian and degree measures.
13. Understand the Unit Circle and its applications in problem solving.
14. Use right triangle trigonometry to determine side lengths, angle measures, and area.
15. Be able to graph the six trigonometric functions with transformations.
16. Find inverse trigonometric functions.
17. Use Fundamental Identities.
18. Solve trigonometric equations.
19. Verify trigonometric identities.
20. Use the Sum and Difference trigonometric formulas, as well as Multiple Angle and Product-Sum formulas.
21. Determine the Law of Sines and the Law of Cosines and use them in real world modeling problems.
22. Investigate vectors in 2- and 3-space and find dot-products.
23. Solve systems of equations and inequalities in 2 and 3 variables.
24. Employ matrices to solve systems of equations.
25. Find the inverse of square matrices.
26. Find the determinant of a square matrix and its applications.
27. Solve height and distance problems using angles of elevation and angles of depression.
28. Use vectors as a tool in other applications of trigonometry.
29. Determine the items in a sequence or series.
30. Determine and use arithmetic and geometric sequences and series.
31. Find partial sums of arithmetic series.
32. Use induction and deduction to solve problems.
33. Use the Binomial Theorem and apply it to real world modeling problems.
34. Use the Counting Principle to determine probability.
35. Understand and be able to generate formulas for topics in analytic geometry.
36. Understand conics, parabolas, ellipses and hyperbolas, their equations, and their graphs.
37. Use parametric equations to solve motion problems.
38. Use polar coordinates and polar equations to generate polar graphs.
39. Determine the polar equations of conics and develop graphs.
40. Have a basic understanding of limits and be able to evaluate limits in given functions.
41. Apply the difference quotient to develop the idea of the slope of the tangent line to a curve.