

Algebra II

Text:	Larson, Boswell, Kanold, & Stiff (2001) <i>Algebra II</i> , Houghton Mifflin Company: Evanston, Illinois.
Supplemental Materials:	TI – 83 or 84 Graphing Calculator
Course Description:	The purpose of this course is to reinforce the student's comprehension of basic algebraic skills and concepts, while developing an understanding of functions and relations, their graphs, and their applications using numeric, graphic, and analytical approaches. Length: One year Credit: 1 unit Prerequisite: Algebra I
Methods of Evaluation:	Students can be evaluated through tests, quizzes, worksheet sets, homework problem sets, Technology grades, semester exams and/or any other form of evaluation instrument the instructor finds applicable to the course.
Pace of Instruction:	First Semester: 1-6 Second Semester: 7-13
Course Objectives:	At the end of this course students should be able to: <ol style="list-style-type: none"> 1. Use a number line to graph and order real numbers. Identify properties and use operations with real numbers. 2. Evaluate algebraic expressions and simplify algebraic expressions by combining like terms. 3. Solve linear equations and use linear equations to answer questions about real – life situations. 4. Solve an equation for one of its variables and rewrite common formulas. Follow a general plan to solve a real – life problem and incorporate other strategies into the plan. 5. Solve simple and compound inequalities. 6. Solve absolute value equations and inequalities. Use absolute value equations and inequalities in real – life situations 7. Identify and represent relations and functions. 8. Graph linear functions and evaluate functions. 9. Find the slope of a line, classify parallel and perpendicular lines. Use slope to solve real – life problems. 10. Use the slope – intercept form or the standard form of a linear equation to graph the equation. 11. Write linear equations. 12. Write and use direct variation equation. 13. Use a scatter plot to identify the correlation shown by a set of data. Approximate the best fitting line for a set of data. 14. Graph linear inequalities in two variables. Use linear inequalities to solve real – life problems.

	<ol style="list-style-type: none"> 15. Represent piecewise functions and use piecewise functions to model real – life quantities. Represent absolute value functions and use them to model real – life situations. 16. Graph and solve systems of linear equations in two variables. Use linear systems to model and solve real – life problems. 17. Use algebraic methods to solve linear systems. 18. Graph a system of linear inequalities to find the solution of the system. 19. Solve linear programming problems. Use linear programming to solve real – life problems. 20. Graph linear equations in three variables. 21. Evaluate linear functions of two variables. Use functions of two variables to model real – life problems. 22. Solve systems of linear equations in three variables. Use linear systems in three variables to model real – life situations. 23. Add and subtract matrices, multiply a matrix by a scalar, and solve matrix equations. Use matrices in real – life situations. 24. Multiply two matrices. Use matrix multiplication in real – life situations. 25. Evaluate determinants of 2x2 and 3x3 matrices. 26. Use Cramer’s Rule to solve systems of linear equations. 27. Find and use inverse matrices. Use inverse matrices in real – life situations. 28. Solve systems of linear equations using inverse matrices. Use systems of linear equations to solve real – life problems. 29. Graph quadratic functions. Use quadratic functions to solve real – life problems. 30. Factor to solve quadratic equations 31. Find zeros of quadratic equations 32. Solve quadratic equations by finding square roots. Using quadratic equations to solve real – life problems. 33. Solve quadratic equations with complex solutions 34. Perform operations with complex numbers 35. Solve equations by completing the square 36. Write quadratic functions in vertex form 37. Solve equations using the quadratic formula. Use the quadratic formula to solve real – life problems. 38. Graph quadratic inequalities in two variables 39. Solve quadratic inequalities in one variable 40. Write functions given characteristics of their graphs 41. Evaluate and simplify expressions involving powers. Use exponents and scientific notation to solve problems. 42. Evaluate And graph a polynomial function 43. Add, subtract, and multiply polynomial and use polynomial operations in real – life problems. 44. Factor polynomial expressions and use factoring to solve polynomial equations. 45. Divide polynomials and use polynomial division in real – life problems.
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	<p>46. Find the rational zeros of a polynomial function. Use polynomial equation to solve real – life problems.</p> <p>47. Determine the number of zeros of a polynomial function and approximate the real zeros.</p> <p>48. Analyze the graph of a polynomial function to answer questions about real – life situations.</p> <p>49. Use finite differences to find the degree of a polynomial that will fit a set of data and find polynomial models for real – life data.</p> <p>50. Evaluate nth root of real numbers using both radical and rational exponent notation. Use nth roots to solve real – life problems.</p> <p>51. Use properties of rational exponents to evaluate and simplify expressions and to solve real – life problems.</p> <p>52. Perform operations with functions and use power functions and function operations to solve real – life problems.</p> <p>53. Find inverses of linear and nonlinear functions.</p> <p>54. Graph square root and cube root functions and use square root and cube root functions to find real – life quantities.</p> <p>55. Solve equations that contain radicals or rational exponents and use radical equations to solve real – life problems.</p> <p>56. Use measures of central tendency and measure of dispersion to describe data sets. Use box and whisker plots and histograms to represent data graphically.</p> <p>57. Graph exponential growth and decay functions and use exponential growth and decay functions to model real – life situations.</p> <p>58. Use the number e as the base of exponential functions and use the natural base e in real – life situations.</p> <p>59. Evaluate and graph logarithmic functions</p> <p>60. Use properties of logarithms and apply them to solve real – life problems.</p> <p>61. Solve exponential and logarithmic equations.</p> <p>62. Model data using exponential functions and power functions.</p> <p>63. Evaluate and graph logistic growth functions. Use logistic growth functions to model real – life quantities.</p> <p>64. Write and use inverse and joint variation models.</p> <p>65. Graph simple rational functions and use the graphs to solve real – life problems.</p> <p>66. Graph general rational functions and use the graph to solve real – life problems.</p> <p>67. Multiply and divide rational expressions and use rational expression to model real – life situations.</p> <p>68. Add and subtract rational expressions. Simplify complex fractions.</p> <p>69. Solve rational equations and use rational equations to solve real – life problems.</p> <p>70. Find the distance between two points and find the midpoint of the line segment connecting two points. Use the distance and midpoint formulas in real – life situations.</p> <p>71. Draw parabolas, write equations of parabolas, and use parabolas</p>
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	<p>to solve real – life problems.</p> <p>72. Graph conics (circles, ellipses, hyperbolas), write equations of conics, and use conics to solve real – life problems.</p> <p>73. Write and graph an equation of a parabola with its vertex at (h,k) and an equation of a circle, ellipse or hyperbola with its center at (h,k). Classify a conic section using its equation.</p> <p>74. Solve systems of quadratic equations and use quadratic systems to solve real – life problems.</p> <p>75. Use and write sequences. Use summation notation to write series and find sums of series.</p> <p>76. Write rules for arithmetic and geometric sequences and find sums of arithmetic and geometric series. Use arithmetic and geometric sequences and series to model real – life problems.</p> <p>77. Find sums of infinite geometric series. Use infinite geometric series as models of real – life situations.</p> <p>78. Evaluate and write recursive rules for sequences. Use recursive rules to solve real – life problems.</p> <p>79. Use the fundamental counting principle and permutations to count the number of ways an event can happen.</p> <p>80. Use combinations to count the number of ways an event can happen. Use the binomial theorem to expand a binomial that is raised to a power.</p> <p>81. Find theoretical, experimental, and geometric probabilities.</p> <p>82. Find probabilities of unions and intersections of two events. Use complement to find the probability of an event.</p> <p>83. Find the probability of independent and dependent events.</p> <p>84. Find binomial probabilities and analyze binomial distributions. Test a hypothesis.</p> <p>85. Calculate probabilities using normal distributions. Use normal distributions to approximate binomial distributions.</p> <p>86. Use trigonometric relationships to evaluate trigonometric functions of acute angles. Use trigonometric functions to solve real – life problems.</p> <p>87. Measure angles in standard position using degree measure and radian measure. Measure arc lengths and areas of sectors.</p> <p>88. Evaluate trigonometric and inverse trigonometric functions of any angle and use trigonometric and inverse trigonometric functions to solve real – life problems.</p> <p>89. Use law of sines and cosines to find the sides and angles of a triangle. Find the area of any triangle. Use Heron’s formula to find area of triangle.</p> <p>90. Use parametric equations to represent motion in a plane and to represent projectile motion.</p>
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