

Alg II Syllabus (First Semester)

Unit 1: Solving linear equations and inequalities

Lesson 01: Solving linear equations

Lesson 02: Solving linear inequalities (See Calculator Appendix A and associated video.)

Lesson 03: *Solving combined (compound) inequalities

Lesson 04: Converting words to algebraic expressions

Lesson 05: Solving word problems with linear equations

Lesson 06: *Graphing calculator solutions of absolute value problems (See Calculator Appendix D & associated video, and Enrichment Topic A.)

Unit 1 review

Test: Unit 1 test

Unit 2: Slope; Solving a linear system of two equations

Lesson 01: Slopes of lines: four different points of view

Lesson 02: Two forms for the equation of a line

Lesson 03: Graphical meaning of the solution to two linear equations

Lesson 04: Algebraic solutions (elimination & substitution) for two linear equations

Lesson 05: Word problems involving two linear equations

Lesson 06: Graphing calculator solutions of linear systems (See Calculator Appendix C and associated video.)

Unit 2 review

Test: Unit 2 test

Unit 3: Graphing linear inequalities in two variables

Lesson 01: Graphing single linear inequalities in two variables

Lesson 02: Graphing systems of linear inequalities in two variables

Lesson 03: *Graphing calculator- graphing systems of linear inequalities in two variables (See Calculator Appendices B & E and associated videos. Also see Enrichment Topic B.)

Cumulative review, unit 3

Unit 3 review

Test: Unit 3 test

Unit 4: Multiplying and Factoring Polynomials

Lesson 01: Simple polynomial multiplication and factoring

Lesson 02: $(a + b)^2$, $(a - b)^2$, $(a - b)(a + b)$ --- multiplying and factoring

Lesson 03: More trinomial factoring (Leading coefficient not one)

Lesson 04: Solving equations by factoring

Lesson 05: *Solving word problems with factoring

Lesson 06: *Binomial expansion theorem

Cumulative review, unit 4

Unit 4 review

Unit 4 test

Unit 5: Exponents and radicals

Lesson 01: Exponent rules (This lesson will likely span two days)

Lesson 02: Negative exponents

Lesson 03: More exponent problems

Lesson 04: Simplifying radical expressions

Lesson 05: Fractional exponents

Lesson 06: *Solving equations having rational & variable exponents

Lesson 07: *Solving radical equations

Lesson 8: Rationalizing denominators

Cumulative review, unit 5

Unit 5 review

Unit 5 test

Unit 6: Completing the square, the quadratic formula

Lesson 1: Solving equations by taking the square root

Lesson 2: Completing the square

Lesson 3: *Deriving the quadratic formula

Lesson 4: Using the quadratic formula

Lesson 5: Determining the nature of the roots; The discriminant

Cumulative review, unit 6

Unit 6 review

Unit 6 test

Unit 7: Relations and functions

Lesson 1: Representations of relations and functions

Lesson 2: Independent & dependent variables; Domain & range (See Calculator Appendix F and associated video.)

Lesson 3: Function notation; Evaluating functions

Lesson 4: *Even and odd functions (See Calculator Appendix G and associated video.)

Lesson 5: Putting it all together: x-axis & y-axis associations

Cumulative review, unit 7

Unit 7 review

Unit 7 test

Unit 8: Analyzing and graphing quadratic functions

Lesson 1: Forms of quadratic functions

Lesson 2: Finding intercepts and graphing quadratic equations

Lesson 3: *Analysis of quadratic functions

Lesson 4: Using graphs to analyze quadratic transformations

Lesson 5: *Writing quadratic functions

Lesson 6: Analyzing quadratic functions with a graphing calculator

Lesson 7: *Quadratic inequalities

Cumulative review, unit 8

Unit 8 review

Unit 8 test

Unit 9: Reflections, translations, and inverse functions

Lesson 1: Reflection fundamentals

Lesson 2: Translations and reflection of relations

Lesson 3: *Inverse function fundamentals

Lesson 4: *Determining if two relations are inverses of each other

Cumulative review, unit 9

Unit 9 review

Unit 9 test

Semester summary

Semester review

Semester test

Enrichment Topics

Topic A: Analysis of absolute value inequalities

Topic B: Linear Programming

Topic C: Point-slope and intercept forms of a line

Topic D: The summation operator, Σ

Topic E: An unusual look at probability

Topic F: Rotations

Topic G: Absolute value parent functions

Topic H: Dimension changes affecting perimeter, area, and volume

Topic I: Algebraic solution to three equations in three variables

Topic J: Algebraic solution to quadratic systems of equations.

Topic K: Derivation of the sine law

Topic L: Derivation of the cosine law

Topic M: Tangent composite function derivations

Topic N: Locating the vertex of a standard-form parabola

Topic O: Algebraic manipulation of inverse trig functions

Topic P: Logarithm theorem derivations

Topic Q: Arithmetic and geometric sum formulas

Topic R: Converting general form conics to standard form

Topic S: Conic section applications

Topic T: A close look at composite functions
Restrictions on the domain

Topic U: "Box" method of trinomial factoring