

Algebra II HSCEs - Alignment Worksheet

Text: Algebra 2 A Edition: Prentice Hall (2004)

| Expectation | Location in Resources by Chapter and Lesson | Depth of Instruction 1 – Mentioned 2 – Partially Developed 3 – Complete |
|--|---|--|
| STANDARD L1: REASONING ABOUT NUMBERS, SYSTEMS, AND QUANTITATIVE LITERACY | | |
| L1.2 Representations and Relationships | | |
| L1.2.1 Use mathematical symbols to represent quantitative relationships and situations. | Ch.1(introduced), throughout | 3 |
| L1.3 Counting and Probabilistic Reasoning | | |
| L1.3.1 Describe, explain, and apply various counting techniques; relate combinations to Pascal's triangle; know when to use each technique. | 6-7,6-8 | 3 |
| L1.3.2 Define and interpret commonly used expressions of probability. | 9-7 | 3 |
| L1.3.3 Recognize and explain common probability misconceptions such as "hot streaks" and "being due." | Supplement | 1 |
| STANDARD L2: CALCULATION, ALGORITHMS, AND ESTIMATION | | |
| L2.1 Calculation Using Real and Complex Numbers | | |
| L2.1.3 Explain the exponential relationship between a number and its base 10 logarithm, and use it to relate rules of logarithms to those of exponents in expressions involving numbers. | 8-3,8-4,8-5,8-6(ln) | 3 |
| L2.1.5 Add, subtract, and multiply complex numbers; use conjugates to simplify quotients of complex numbers. | 5-6,6-5 | 3 |

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| L2.2 Sequences and Iteration | | |
| L2.2.1 Find the n th term in arithmetic, geometric, or other simple sequences. | 11-2,11-3 | 3 |
| L2.2.2 Compute sums of finite arithmetic and geometric sequences. | 11-4 | 3 |
| L2.2.3 Use iterative processes in such examples as computing compound interest or applying approximation procedures. | 8-2 | 3 |
| L2.3 Measurement Units, Calculations, and Scales | | |
| L2.3.2 Describe and interpret logarithmic relationships in such contexts as the Richter scale, the pH scale, or decibel measurements; solve applied problems. | 8-3 | 3 |
| L2.4 Understanding Error | | |
| L2.4.1 Determine what degree of accuracy is reasonable for measurements in a given situation; express accuracy through use of significant digits, error tolerance, or percent of error; describe how errors in measurements are magnified by computation; recognize accumulated error in applied situations. | p. 854, supplement | 1 |
| L2.4.2 Describe and explain round-off error, rounding, and truncating. | Throughout | 3 |
| L2.4.3 Know the meaning of and interpret statistical significance, margin of error, and confidence level. | 12-5 | 3 |
| STANDARD A1: EXPRESSIONS, EQUATIONS AND INEQUALITIES | | |
| A1.1 Construction, Interpretation, and Manipulation of Expressions | | |
| A1.1.1 Give a verbal description of an expression that is presented in symbolic form, write an algebraic expression from a verbal description, and evaluate expressions given values of the variables. | Linear, quad., ration., log., exponential | 3 |

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| A1.1.4 Add, subtract, multiply, and simplify polynomials and rational expressions. | 6-2,6-3,9-5,9-4 | 3 |
| A1.1.5 Divide a polynomial by a monomial. | 6-3(synthetic div.) | 3 |
| A1.1.6 Transform exponential and logarithmic expressions into equivalent forms using the properties of exponents and logarithms, including the inverse relationship between exponents and logarithms. | 8-3,8-4 | 3 |
| A1.2 Solutions of Equations and Inequalities | | |
| A1.2.2 Associate a given equation with a function whose zeros are the solutions of the equation. | 6-2 | 3 |
| A1.2.5 Solve polynomial equations and equations involving rational expressions and justify steps in the solution. | 6-2,6-3,6-4,6-5,6-6,9-1,9-6 | 3 |
| A1.2.7 Solve exponential and logarithmic equations and justify steps in the solution. | 8-5,8-6(ln) | 3 |
| A1.2.8 Solve an equation involving several variables (with numerical or letter coefficients) for a designated variable, and justify steps in the solution. | Ch.5,Ch.6 | 3 |
| A1.2.9 Know common formulas and apply appropriately in contextual situations. | See list. | 3 |
| A1.2.10 Use special values of the inverse trigonometric functions to solve trigonometric equations over specific intervals. | p.703, 13-2 | 3 |
| STANDARD A2: FUNCTIONS | | |
| A2.1 Definitions, Representations, and Attributes of Functions | | |
| A2.1.1 Determine whether a relationship (given in contextual, symbolic, tabular, or graphical form) is a function, and identify its domain and range. | 7-6,7-7,recall mapping | 3 |

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| A2.1.2 Read, interpret, and use function notation, and evaluate a function at a value in its domain. | 7-6,7-7,throughout | 3 |
| A2.1.3 Represent functions in symbols, graphs, tables, diagrams, or words, and translate among representations. | Throughout | 3 |
| A2.1.6 Identify the zeros of a function, the intervals where the values of a functions are positive or negative, and describe the behavior of a functions as x approaches positive or negative infinity, given the symbolic and graphical representations. | 6-1(p.306),6-2 | 3 |
| A2.1.7 Identify and interpret the key features of a function from its graph or its formula(s). | 6-1,6-2 | 3 |
| A2.3 Representations of Functions | | |
| A2.3.1 Identify a function as a member of a family of functions based on its symbolic or graphical representations; recognize that different families of functions have different asymptotic behavior. | 2-2,2-3,2-5,5-2,6-1,7-8,8-1,9-2,13-4,13-5,13-6,13-7 | 3-develop charts |
| A2.3.3 Write the general symbolic forms that characterize each family of functions. | (see above) | 3 |
| A2.4 Models of Real-world Situations Using Families of Functions | | |
| A2.4.1 Identify the family of function best suited for modeling a given real-world situation. | Throughout, Ti-83+ applications | 3 |
| A2.4.2 Adapt the general symbolic form of a function to one that fits the specifications of a given situation by using the information to replace arbitrary constants with numbers. | Throughout: linear,quad.,exp.,log., cubic | 3 |
| A2.4.3 Using the adapted general symbolic form, draw reasonable conclusions about the situation being modeled. | Throughout, Ti-83+ apps. Ch.2,5,8,9 | 3 |

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| STANDARD A3: FAMILIES OF FUNCTIONS | | |
| A3.2 Exponential and Logarithmic Functions | | |
| A3.2.2 Interpret the symbolic forms and recognize the graphs of exponential and logarithmic functions. | 8-1,8-2,8-3 | 3 |
| A3.2.3 Apply properties of exponential and logarithmic functions. | 8-4,8-5, | 3 |
| A3.6 Rational Functions | | |
| A3.6.1 Write the symbolic form and sketch the graph of simple rational functions. | 9-1,9-2 | 3 |
| A3.6.2 Analyze graphs of simple rational functions and understand the relationship between the zeros of the numerator and denominator, and the function's intercepts, asymptotes, and domain. | 9-3,9-4 | 3 |
| A3.7 Trigonometric Functions | | |
| A3.7.1 Use the unit circle to define sine and cosine; approximate values of sine and cosine; use sine and cosine to define the remaining trigonometric functions; explain why the trigonometric functions are periodic. | 13-1,p.203,13-2 | 3 |
| A3.7.2 Use the relationship between degree and radian measures to solve problems. | 13-3,14-3,14-4,14-5 | 3 |
| A3.7.3 Use the unit circle to determine the exact values of sine and cosine, for integer multiples of $\pi/6$ and $\pi/4$. | p.716,13-3 | 3 |
| A3.7.4 Graph the sine and cosine, functions; analyze graphs by noting domain, range, period, amplitude, location of maxima and minima, and asymptotes. | 13-4,13-5,13-6 | 3 |
| A3.7.5 Graph transformations of basic trigonometric functions (involving changes in period, amplitude, phase, and midline) and understand the relationship between constants in the formula and the transformed graph. | 13-7 | 3 |

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| STANDARD G1: FIGURES AND THEIR PROPERTIES G1.7 Conic Sections and Their Properties | | |
| G.1.7.1 Find an equation of a circle given its center and radius; given the equation of a circle, find its center and radius. | 10-3 | 3 |
| G1.7.2 Identify and distinguish among geometric representations of parabolas, circles, ellipses, and hyperbolas; describe their symmetries, and explain how they are related to cones. | 10-2,10-3,10-4 | 3 |
| G1.7.3 Graph ellipses and hyperbolas with axes parallel to the x- and y-axes, given equations. | 10-1,10-4,10-5 | 3 |
| STANDARD S1: UNVARIATE DATA-EXAMINING DISTRIBUTIONS S1.1 Producing and Interpreting Plots | | |
| S1.1.1 Construct and interpret dot plots, histograms, relative frequency histograms, bar graphs, basic control charts, and box plots with appropriate labels and scales; determine which kinds of plots are appropriate for different types of data; compare data sets and interpret differences based on graphs and summary statistics. | 12-1 | 3 |
| S1.1.2 Given a distribution of a variable in a data set, describe its shape, including symmetry or skewness, and state how the shape is related to measures of center (mean and median) and measures of variation (range and standard deviation) with particular attention to the effects of outliers on these measures. | 12-1,12-3 | 3 |
| S1.2 Measures of Center and Variation | | |
| S1.2.1 Calculate and interpret measures of center including: mean, median, and mode; explain uses, advantages and disadvantages of each measure given a particular set of data and its context. | 12-3 | 3 |

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| S1.2.2 Estimate the position of the mean, median, and mode in both symmetrical and skewed distributions, and from a frequency distribution or histogram. | 12-3 | 3 |
| S1.2.3 Compute and interpret measures of variation, including percentiles, quartiles, interquartile range, variance, and standard deviation. | 12-3 | 3 |
| S1.3 The Normal Distribution | | |
| S1.3.1 Explain the concept of distribution and the relationship between summary statistics for a data set and parameters of a distribution. | Ch.12,supplements | 3 |
| S1.3.2 Explain the concept of distribution and the relationship between summary statistics for a data set and parameters of a distribution. | 12-7 | 3 |
| S1.3.3 Know and use the fact that about 68%, 95%, and 99.7% of the data lie within one, two, and three standard deviations of the mean, respectively in a normal distribution. | 12-4 | 3 |
| S1.3.4 Calculate z -scores, use z -scores to recognize outliers, and use z -scores to make informed decisions. | 12-4 | 3 |
| STANDARD S3: SAMPLES, SURVEYS, AND EXPERIMENTS | | |
| S3.1 Data Collection and Analysis | | |
| S3.1.1 Know the meanings of a sample from a population and a census of a population, and distinguish between sample statistics and population parameters. | Ch.12,supplements | 3 |

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| S3.1.2 Identify possible sources of bias in data collection, sampling methods and simple experiments; describe how such bias can be reduced and controlled by random sampling; explain the impact of such bias on conclusions made from analysis of the data; and know the effect of replication on the precision of estimates. | Supplement | 3 |
| S3.1.3 Distinguish between an observational study and an experimental study, and identify, in context, the conclusions that can be drawn from each. | Supplement | 3 |
| STANDARD S4: PROBABILITY MODELS AND PROBABILITY CALCULATION | | |
| S4.1 Probability | | |
| S4.1.1 Understand and construct sample spaces in simple situations (e.g., tossing two coins, rolling two number cubes and summing the results). | 1-6,12-2 | 3 |
| S4.1.2 Define mutually exclusive events, independent events, dependent events, compound events, complementary events and conditional probabilities; and use the definitions to compute probabilities. | 12-2,6-7,9-7 | 3 |
| S4.2 Application and Representation | | |
| S4.2.1 Compute probabilities of events using tree diagrams, formulas for combinations and permutations, Venn diagrams, or other counting techniques. | 12-2 | 3 |
| S4.2.2 Apply probability concepts to practical situations, in such settings as finance, health, ecology, or epidemiology, to make informed decisions. | Supplement | 3 |

Pacing Guide for Algebra II A

Marking Period 1: Polynomials

- 6.1
- 6.2
- 6.3
- 6.4
- 6.5
- Supplemental Michigan Algebra 2 Moodle Content, & Algebra 2 EMaths

Marking Period 2: Rational functions & Graphing

- 9.2
- 9.3
- 9.4
- 9.5
- 9.6
- Supplemental Michigan Algebra 2 Moodle Content, & Algebra 2 EMaths

Marking Period 3: Exponents & Radical Review

- Algebra 1 Book & Online review materials
- Supplemental Michigan Algebra 2 Moodle Content, & Algebra 2 EMaths

Marking Period 4: Exponential & Logs

- 8.1
- 8.2
- 8.3
- 8.4
- 8.5
- Supplemental Michigan Algebra 2 Moodle Content, & Algebra 2 EMaths

Marking Period 5: Sequences & Series

- Algebra 1 Review
- 11.2
- 11.3
- 11.4
- 11.5
- Supplemental Michigan Algebra 2 Moodle Content, & Algebra 2 EMaths

Marking Period 6: Fraction Review & Probability Intro

- Pre-algebra & online fraction review materials (Kuta)
- Algebra 1 Intro materials
- 12.2
- Supplemental Michigan Algebra 2 Moodle Content, & Algebra 2 EMaths

Algebra IIB Pacing Guide

| Semester 1 | Semester 2 |
|---|--|
| Unit 1 Linear Functions Chapter 3 & Supplement with Moodle | Unit 6 Univariate Data eMaths Material & Supplement with Moodle |
| Unit 2 Quadratic Functions Chapter 5 & Supplement with Moodle | Unit 7 Counting & Probability Chapter 12, Supplemental Materials, & Moodle |
| Unit 3 Polynomials Chapter 6 & Supplement with Moodle | Unit 8 Matrices Chapter 4 |
| Unit 4 Rational Functions Chapter 6 & Supplement with Moodle | |
| Unit 5 Conics Chapter 10 & Supplement with Moodle | |
| Semester 1 Exam | Semester 2 Exam |