Imlay City High School Algebra 2 Alignment Record

Textbook: Prentice Hall Mathematics "Algebra 2"

Chapter and Section	HSCE Code and Description
Chapter 1	
Section 1-5	L3.2.1 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.
Section 1-6	L1.3.3 Recognize and explain common probability misconceptions such as "hot streaks" and "being due." S4.1.1 Understand and construct sample spaces in simple situations (e.g., tossing two coins, rolling two number cubes and summing the results). 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. S4.2.2 Apply probability concepts to practical situations, in such settings as finance, health, ecology, or epidemiology, to make informed decisions.
Chapter 2	
Section 2-1	A2.3.3 Write the general symbolic forms that characterize each family of functions (e.g., $f(x) = A_0a^x$; $f(x) = A\sin Bx$).
Section 2-2	A1.2.9 Know common formulas (e.g., slope, distance between two points, quadratic formula, compound interest, distance = rate · time), and apply appropriately in contextual situations.
Section 2-4	A3.1.1 Identify the family of functions best suited for modeling a given real-world situation (e.g., quadratic functions for motion of an object under the force of gravity; exponential functions for compound interest; trigonometric functions for periodic phenomena. *In the example above, recognize that the appropriate general function is exponential* ($P = P_0a^t$). 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.
Chapter 5	
Section 5-1	A2.3.3 Write the general symbolic forms that characterize each family of functions (e.g., $f(x) = A_0a^x$; $f(x) = A\sin Bx$).

	A3.1.1 Identify the family of functions best suited for modeling a given real-world situation (e.g., quadratic functions for motion of an object under the force of gravity; exponential functions for compound interest; trigonometric functions for periodic phenomena. *In the example above, recognize that the appropriate general function is exponential* ($P = P_0a^t$).
Section 5-5	A1.2.5 Solve polynomial equations and equations involving rational expressions (e.g., solve $-2x(x^2 + 4x+3) = 0$; solve $x - \frac{1}{x+6} = 3$, and justify steps in the solution.
Section 5-8	A1.2.9 Know common formulas (e.g., slope, distance between two points, quadratic formula, compound interest, distance = rate · time), and apply appropriately in contextual situations.
Chapter 6	
Section 6-1	A2.3.3 Write the general symbolic forms that characterize each family of functions (e.g., $f(x) = A_0a^x$; $f(x) = A\sin Bx$).
Section 6-2	A1.1.4 Add, subtract, multiply, and simplify polynomials and rational expressions (e.g., multiply $(x - 1)(1 - x^2 + 3)$; simplify $\frac{9x - x^3}{x+3}$.
Section 6-3	A1.1.4 Add, subtract, multiply, and simplify polynomials and rational expressions (e.g., multiply $(x - 1)(1 - x^2 + 3)$; simplify $\frac{9x - x^3}{x+3}$. A1.1.5 Divide a polynomial by a monomial.
Section 6-4	A1.2.5 Solve polynomial equations and equations involving rational expressions (e.g., solve $-2x(x^2 + 4x+3) = 0$; solve $x - \frac{1}{x+6} = 3$, and justify steps in the solution.
Section 6-7	L1.3.1 Describe, explain, and apply various counting techniques (e.g., finding the number of different 4-letter passwords; permutations; and combinations); relate combinations to Pascal's triangle; know when to use each technique. S4.2.1 Compute probabilities of events using tree diagrams, formulas for combinations and permutations, Venn diagrams, or other counting techniques.
Section 6-8	L1.3.1 Describe, explain, and apply various counting techniques (e.g., finding the number of different 4-letter passwords; permutations; and combinations); relate combinations to Pascal's triangle; know when to use each technique.

	S4.2.1 Compute probabilities of events using tree diagrams, formulas for combinations and permutations, Venn diagrams, or other counting techniques. S4.2.2 Apply probability concepts to practical situations, in such settings as finance, health, ecology, or epidemiology, to make informed decisions.
Chapter 7	
Section 7-6	A1.1.4 Add, subtract, multiply, and simplify polynomials and rational expressions (e.g., multiply $(x - 1)(1 - x^2 + 3)$; simplify $\frac{9x - x^3}{x + 3}$. *A2.2.5* Write an expression for the composition of one function with another; recognize component functions when a function is a composition of other functions. (Recommended)* *A2.2.6* Know and interpret the function notation for inverses and verify that two functions are inverses using composition. (Recommended)*
Section 7-7	*A2.2.4* If a function has an inverse, find the expression(s) for the inverse. (Recommended)* *A2.2.6* Know and interpret the function notation for inverses and verify that two functions are inverses using composition. (Recommended)*
Chapter 8	
Section 8-1	A2.3.3 Write the general symbolic forms that characterize each family of functions (e.g., $f(x) = A_0a^x$; $f(x) = A\sin Bx$). A2.5.2 Interpret the symbolic forms and recognize the graphs of exponential and logarithmic functions (e.g., $f(x) = 10^x$, $f(x) = \log x$, $f(x) = e^x$, $f(x) = \ln x$). A3.1.1 Identify the family of functions best suited for modeling a given real-world situation (e.g., quadratic functions for motion of an object under the force of gravity; exponential functions for compound interest; trigonometric functions for periodic phenomena. *In the example above, recognize that the appropriate general function is exponential* ($P = P_0a^t$). A3.1.2 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. *In the example above, substitute the given values* $P_0 = 300$ *and* $a = 1.02$ *to obtain* $P = 300(1.02)^t$.
Section 8-2	A1.2.9 Know common formulas (e.g., slope, distance between two points, quadratic formula, compound interest, distance = rate · time), and apply appropriately in contextual situations.

	A2.5.2 Interpret the symbolic forms and recognize the graphs of exponential and logarithmic functions (e.g., $f(x) = 10^x$, $f(x) = \log x$, $f(x) = e^x$, $f(x) = \ln x$). A2.5.3 Apply properties of exponential and logarithmic functions (e.g., $a^{x+y} = a^x a^y$; $\log(ab) = \log a + \log b$).
Section 8-3	A2.5.2 Interpret the symbolic forms and recognize the graphs of exponential and logarithmic functions (e.g., $f(x) = 10^x$, $f(x) = \log x$, $f(x) = e^x$, $f(x) = \ln x$).
Section 8-4	A2.3.3 Write the general symbolic forms that characterize each family of functions (e.g., $f(x) = A_0 a^x$; $f(x) = A\sin Bx$). A2.5.2 Interpret the symbolic forms and recognize the graphs of exponential and logarithmic functions (e.g., $f(x) = 10^x$, $f(x) = \log x$, $f(x) = e^x$, $f(x) = \ln x$). A2.5.3 Apply properties of exponential and logarithmic functions (e.g., $a^{x+y} = a^x a^y$; $\log(ab) = \log a + \log b$).
Section 8-5	A1.2.7 Solve exponential and logarithmic equations (e.g., $3(2^x) = 24$), $2\ln(x + 1) = 4$), and justify steps in the solution. A2.5.2 Interpret the symbolic forms and recognize the graphs of exponential and logarithmic functions (e.g., $f(x) = 10^x$, $f(x) = \log x$, $f(x) = e^x$, $f(x) = \ln x$). A3.1.1 Identify the family of functions best suited for modeling a given real-world situation (e.g., quadratic functions for motion of an object under the force of gravity; exponential functions for compound interest; trigonometric functions for periodic phenomena. *In the example above, recognize that the appropriate general function is exponential* ($P = P_0 a^t$).
Section 8-6	L2.2.3 Use iterative processes in such examples as computing compound interest or applying approximation procedures. A1.2.7 Solve exponential and logarithmic equations (e.g., $3(2^x) = 24$), $2\ln(x + 1) = 4$), and justify steps in the solution. A2.3.3 Write the general symbolic forms that characterize each family of functions (e.g., $f(x) = A_0 a^x$; $f(x) = A\sin Bx$). A2.5.2 Interpret the symbolic forms and recognize the graphs of exponential and logarithmic functions (e.g., $f(x) = 10^x$, $f(x) = \log x$, $f(x) = e^x$, $f(x) = \ln x$).

	A2.5.3 Apply properties of exponential and logarithmic functions (e.g., $a^{x+y} = a^x a^y$; $\log(ab) = \log a + \log b$). A3.1.1 Identify the family of functions best suited for modeling a given real-world situation (e.g., quadratic functions for motion of an object under the force of gravity; exponential functions for compound interest; trigonometric functions for periodic phenomena. *In the example above, recognize that the appropriate general function is exponential* ($P = P_0 a^t$).
Chapter 9	
Section 9-1	A2.9.1 Write the symbolic form and sketch the graph of simple rational functions.
Section 9-2	A2.9.1 Write the symbolic form and sketch the graph of simple rational functions.
Section 9-3	A2.9.1 Write the symbolic form and sketch the graph of simple rational functions. A2.9.2 Analyze graphs of simple rational functions (e.g., $f(x)=\frac{2x+1}{x-1}$; $g(x)=\frac{x}{x^2-4}$) and understand the relationship between the zeros of the numerator and denominator and the function's intercepts, asymptotes, and domain.
Section 9-4	A1.1.4 Add, subtract, multiply, and simplify polynomials and rational expressions (e.g., multiply $(x - 1)(1 - x^2 + 3)$; simplify $\frac{9x - x^3}{x+3}$. A1.1.5 Divide a polynomial by a monomial.
Section 9-5	A1.1.4 Add, subtract, multiply, and simplify polynomials and rational expressions (e.g., multiply $(x - 1)(1 - x^2 + 3)$; simplify $\frac{9x - x^3}{x+3}$.
Section 9-6	A1.2.5 Solve polynomial equations and equations involving rational expressions (e.g., solve $-2x(x^2 + 4x + 3) = 0$; solve $x - \frac{1}{x+6} = 3$, and justify steps in the solution.
Section 9-7	L1.3.1 Describe, explain, and apply various counting techniques (e.g., finding the number of different 4-letter passwords; permutations; and combinations); relate combinations to Pascal's triangle; know when to use each technique. L1.3.2 Define and interpret commonly used expressions of probability (e.g., chances of an event, likelihood, odds). L1.3.3 Recognize and explain common probability misconceptions such as "hot streaks" and "being due." 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.

	S4.2.1 Compute probabilities of events using tree diagrams, formulas for combinations and permutations, Venn diagrams, or other counting techniques. S4.2.2 Apply probability concepts to practical situations, in such settings as finance, health, ecology, or epidemiology, to make informed decisions.
Chapter 10	
Section 10-1	G1.7.1 Find an equation of a circle given its center and radius; given the equation of a circle, find its center and radius. 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.
Section 10-2	G1.7.1 Find an equation of a circle given its center and radius; given the equation of a circle, find its center and radius.
Section 10-3	G1.7.1 Find an equation of a circle given its center and radius; given the equation of a circle, find its center and radius. 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.
Section 10-4	G1.7.3 Graph ellipses and hyperbolas with axes parallel to the *x*- and *y*-axes, given equations.
Section 10-5	G1.7.3 Graph ellipses and hyperbolas with axes parallel to the *x*- and *y*-axes, given equations.
Chapter 11	
Section 11-1	L2.2.1 Find the *n*th term in arithmetic, geometric, or other simple sequences.
Section 11-2	L2.2.1 Find the *n*th term in arithmetic, geometric, or other simple sequences.
Section 11-3	L2.2.1 Find the *n*th term in arithmetic, geometric, or other simple sequences.
Section 11-4	L1.2.1 Use mathematical symbols (e.g., interval notation, set notation, summation notation) to represent quantitative relationships and situations. L2.2.2 Compute sums of finite arithmetic and geometric sequences.
Section 11-5	L2.2.2 Compute sums of finite arithmetic and geometric sequences.
Chapter 12	
Section 12-1	L1.3.2 Define and interpret commonly used expressions of probability (e.g., chances of an event, likelihood, odds). L1.3.3 Recognize and explain common probability misconceptions such as “hot streaks” and “being due.” S1.3.1 Explain the concept of distribution and the relationship between summary statistics for a data set and parameters of a distribution.

	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. S4.2.1 Compute probabilities of events using tree diagrams, formulas for combinations and permutations, Venn diagrams, or other counting techniques. S4.2.2 Apply probability concepts to practical situations, in such settings as finance, health, ecology, or epidemiology, to make informed decisions.
Section 12-2	L1.3.2 Define and interpret commonly used expressions of probability (e.g., chances of an event, likelihood, odds). L1.3.3 Recognize and explain common probability misconceptions such as “hot streaks” and “being due.” 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. S4.2.1 Compute probabilities of events using tree diagrams, formulas for combinations and permutations, Venn diagrams, or other counting techniques. S4.2.2 Apply probability concepts to practical situations, in such settings as finance, health, ecology, or epidemiology, to make informed decisions.
Section 12-3	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. 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. 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. 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. S1.2.3 Compute and interpret measures of variation, including percentiles, quartiles, interquartile range, variance, and standard deviation.

	S1.3.2 Describe characteristics of the normal distribution, including its shape and the relationships among its mean, median, and mode.
Section 12-4	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. 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. 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. S1.2.3 Compute and interpret measures of variation, including percentiles, quartiles, interquartile range, variance, and standard deviation. 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. S1.3.4 Calculate *z*-scores, use *z*-scores to recognize outliers, and use *z*-scores to make informed decisions.
Section 12-5	L3.2.3 Know the meaning of and interpret statistical significance, margin of error, and confidence level. 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. 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. S3.1.2 Identify possible sources of bias in data collection and 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. S3.1.3 Distinguish between an observational study and an experimental study, and identify, in context, the conclusions that can be drawn from each.
Section 12-6	L1.3.1 Describe, explain, and apply various counting techniques (e.g., finding the number of different 4-letter passwords; permutations; and combinations); relate combinations to Pascal's triangle; know when to use each technique.

	S1.3.1 Explain the concept of distribution and the relationship between summary statistics for a data set and parameters of a distribution.
Section 12-7	S1.3.1 Explain the concept of distribution and the relationship between summary statistics for a data set and parameters of a distribution.
Chapter 13	
Section 13-2	A2.10.1 Use the unit circle to define sine and cosine; approximate values of sine and cosine (e.g., sin 3, or cos 0.5); use sine and cosine to define the remaining trigonometric functions; explain why the trigonometric functions are periodic.
Section 13-3	A2.10.1 Use the unit circle to define sine and cosine; approximate values of sine and cosine (e.g., sin 3, or cos 0.5); use sine and cosine to define the remaining trigonometric functions; explain why the trigonometric functions are periodic. A2.10.2 Use the relationship between degree and radian measures to solve problems. A2.10.3 Use the unit circle to determine the exact values of sine and cosine, for integer multiples of $\pi/6$ and $\pi/4$.
Section 13-4	A2.3.3 Write the general symbolic forms that characterize each family of functions (e.g., $f(x) = A_0a^x$; $f(x) = A\sin Bx$). A2.10.4 Graph the sine and cosine functions; analyze graphs by noting domain, range, period, amplitude, location of maxima and minima, and asymptotes.
Section 13-5	A2.3.3 Write the general symbolic forms that characterize each family of functions (e.g., $f(x) = A_0a^x$; $f(x) = A\sin Bx$). A2.10.4 Graph the sine and cosine functions; analyze graphs by noting domain, range, period, amplitude, location of maxima and minima, and asymptotes.
Section 13-6	A2.3.3 Write the general symbolic forms that characterize each family of functions (e.g., $f(x) = A_0a^x$; $f(x) = A\sin Bx$). A2.10.5 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.
Section 13-7	A2.10.5 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.
Chapter 14	
Section 14-1	*A1.1.7* Transform trigonometric expressions into equivalent forms using basic identities such as: $\sin^2\theta + \cos^2\theta = 1$, $\tan\theta = \frac{\sin\theta}{\cos\theta}$, and $\tan^2\theta + 1 = \sec^2\theta$. (Recommended)*

Section 14-2	A1.2.10 Use special values of the inverse trigonometric functions to solve trigonometric equations over specific intervals (e.g., $2 \sin x - 1 = 0$ for $0 \le x \le 2\pi$).
Skills Handbook	
p. 856	A1.2.9 Know common formulas (e.g., slope, distance between two points, quadratic formula, compound interest, distance = rate · time), and apply appropriately in contextual situations.
p. 857	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.
Found Throughout Text	
	L2.1.6 Recognize when exact answers aren't always possible or practical; use appropriate algorithms to approximate solutions to equations (e.g., to approximate square roots). L3.2.2 Describe and explain round-off error, rounding, and truncating. A3.1.3 Using the adapted general symbolic form, draw reasonable conclusions about the situation being modeled. *In the example above, the exact solution is 365.698, but for this problem an appropriate approximation is 365.*