WCHS

Curriculum Map

Algebra II

| Set | Set Topic | Common Core (KCAS) | ACT Quality Core | Learning Targets | Formative and Summative Assessments |
| --- | --- | --- | --- | --- | --- |
| 1 | Using properties of real numbers |  | A.1.a |  |  |
| 2 | Evaluating expressions and combining like terms |  | F.1a |  |  |
| 3 | Using rules of exponents |  | Alg I skill F.1.a and A.1.a |  |  |
| 4 | Identifying functions and using function notation |  | C.1.d |  |  |
| 5 | Using matrices to organize data and to solve problems |  | I.1.a, b.f |  |  |
| 6 | Finding percent of change |  | B.1.a.  B.1.h |  |  |
| 7 | Solving linear equations | A.CED.1  Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions | A.1.d |  |  |
| 8 | Finding direct variation | A.CED.1  Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions | A.1.d  B.1.c |  |  |
| 9 | Multiplying matrices |  | I.1.a, b, f |  |  |
| 10 | Solving and graphing inequalities | A.APR.1  Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract and multiply polynomials.  A.CED.1  Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions | A.1.d |  |  |
| 11 | Understanding polynomials | A.APR.1  Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract and multiply polynomials | F.1.a |  |  |
| 12 | Solving inverse variation problems |  | B.1.a,h |  |  |
| 13 | Graphing linear equations | A.CED.1  Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions  A.CED.2  Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.  F.IF.6  Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. | A.1.g |  |  |
| 14 | Finding determininants |  | I.1.c  I.1.f |  |  |
| 15 | Solving systems of equations by graphing | A.REI.11  Explain why the x-coordinates of the points where the graphs of the equations y=f(x) and y=g(x) intersect are the solutions of the equation f(x)=g(x); find the solutions approximately, e.g, using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. | A.1.e |  |  |
| 16 | Using Cramer’s Rule | A.REI.11  Explain why the x-coordinates of the points where the graphs of the equations y=f(x) and Y=g(x) intersect are the solutions of the equation f(x)=g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations, include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.\* | A.1.e |  |  |
| 17 | Solving equations and inequalities with absolute value | F.IF.7 b  Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.\*  b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.  F.IF.7e  Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.\*  e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. | D.1.a |  |  |
| 18 | Calculating with units of measures |  | B.1.h  B.1.f  B.1.e |  |  |
| 19 | Multiplying polynomials | A.APR.1  Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract and multiply polynomials | A.1.b  F.1.a |  |  |
| 20 | Performing operations with functions |  | C.1.d |  |  |
|  | INVESTIGATION 2 |  |  |  |  |
| 21 | Solving systems of equations using the substitution method |  | A.1.e |  |  |
| 22  LAB 5 | Analyzing continuous, discontinuous, and discrete functions |  |  |  |  |
| 23 | Factoring polynomials | A.SSE.2  Use the structure of an expression to identify ways to rewrite it.  A.APR.4  Prove polynomial identities and use them to describe numerical relationships. For example, the polynomial identity (x2 +y2)2=(x2-y2)2+(2xy)2 can be used to generate Pythagorean triples. | A.1.c  E.1.a |  |  |
| 24 | Solving systems of equations using the elimination method |  | A.1.e |  |  |
| LAB 6 | Variable statistical data | S.1D.4  Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. |  |  |  |
| 25 | Finding measures of central tendency and dispersion | S.ID.4  Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve. | B.1.h |  |  |
| 26 | Writing the equation of a line | A.CED.1  Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions  F.IF.6  Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. | A.1.f.  . |  |  |
| 27 | Connecting the parabola with the quadratic function | F.IF.8  Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. | E.1.d  F.2.c  F.2.d  E.2.a |  |  |
| 28 | Simplifying rational expressions | F.IF.5  Relate the domain of a function to its graph and where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.\* | B.1.h |  |  |
| 29 | Solving systems of equations in three variables |  | D.1.c |  |  |
| 30 | Applying transformations to the parabola and determining the minimum or maximum | F.IF.9  Compare properties of two functions each represented in a different way (algebraically, graphically, numerically, in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.  F.BF.1 b c+  Write a function that describes a relationship between two quantities\*  b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.  F.BF.3  Identify the effect on the graph by replacing f(x) by f(x) + k, k f(x), f(kx) and f(x+k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. | E.2.b  F.2.d  E.3.b  E.3.c  E.3.d |  |  |
|  | Investigation 3 |  | D.1.3 |  |  |
| 31 | Multiplying and dividing rational expressions | A.APR.7 (+) Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions. | F.1.a |  |  |
| 32 | Solving linear systems with matrix inverses |  | I.1.d  I.1.e |  |  |
| 33 | Applying counting principles |  | H.1.a  H.1.d |  |  |
| 34 | Graphing linear equations II | A.CED.1  Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions  F.IF.6  Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.  A.CED. 2  Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. | A.1.g |  |  |
| 35 | Solving quadratic equations | A.REI.4-6  Solve quadratic equations in one variable.   1. Use the method of completing the square to transform any quadratic equation in x into an equation of the form (x-p)2=q that has the same solutions. Derive the quadratic formula from this form. 2. Solve quadratic equations by inspection (e.g., for x2=49) taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as *a* + *bi* for real numbers a and b.   A.REI.5  Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.  A.REI.6  Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. | E.1.a  F.2.c |  |  |
| 36 | Using parallel and perpendicular lines |  | B.1.f |  |  |
| 37 | Adding and subtracting rational expressions | A.APR.7  (+) Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions. | B.1.h  G.1.a |  |  |
| 38 | Dividing polynomials using long division | A.APR.2  Know and apply the Remainder Theorem: For a polynomial p(x) and a number a, the remainder on division by x-a is p(a), so p(a)=0 if and only if (x-a) is a factor of p(x).  A.APR.6  Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q(x)+r(x)/b(x) where a(x), b(x), q(x) and r(x) are polynomials with the degree of r(x) less than the degree of b(x), using inspection, long division or, for the more complicated examples; a computer algebra system. | F.1.d |  |  |
| 39 | Graphing linear inequalities in two variables | A.CED.1  Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions  A.CED.2  Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. | A.1.d |  |  |
| 40 | Simplifying radical expressions |  | G.1.b  G.1.c  G.1.d |  |  |
| 41 | Using the Pythagorean Theorem and Distance formula | A.APR.4  Prove polynomial identities and use them to describe numerical relationships. For example, the polynomial identity (x2 +y2)2=(x2-y2)2+(2xy)2 can be used to generate Pythagorean triples. | A.1.h |  |  |
| ~~42~~ | ~~Finding permutations and combinations~~ |  | H.1.b |  |  |
| 43 | Solving systems of linear equations | A.CED.1  Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions  A.CED.2  Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.  A.CED.3  Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods. | G.2.a |  |  |
| 44 | Rationalizing denominators |  | G.1.a |  |  |
| 45 | Finding the line of best fit | F.IF.6  Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. | B.1.b  B.1.c |  |  |
| 46 | Finding trigonometric functions and their reciprocals | F.TF.5  Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency and midline. | A.1.c |  |  |
| 47 | Graphing exponential functions | F.IF.7 b  Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.\*  b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.  F.IF.7e  Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.\*  e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.  F.BF.1 ‘Write a function that describes a relationship between two quantities\*  b. Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.  F.BF.3  Identify the effect on the graph by replacing f(x) by f(x) + k, k f(x), f(kx) and f(x+k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. | G.2.a |  |  |
| 48 | Understanding complex fractions |  | B.1.h |  |  |
| 49 | ~~Using the binomial theorem~~ | ~~A.APR.5~~  ~~Know and apply the Binomial Theorem for the expansion of (x+y)~~~~n~~ ~~in powers of x and y for a positive integer n, where x and y are any numbers with coefficients determined for example by Pascal’s Triangle.~~ |  |  |  |
| 50 | Finding inverses of relations and functions | F.BF.4a | C.1.d |  |  |
| 51 | Using synthetic division | A.APR.2  A.APR.6  Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q(x)+r(x)/b(x) where a(x), b(x), q(x) and r(x) are polynomials with the degree of r(x) less than the degree of b(x), using inspection, long division or, for the more complicated examples; a computer algebra system. | F.1.6 |  |  |
| LAB 9 | Graphs of Trig Functions | F.IF.7 e | G.3.d  G.3.e  G.3.f |  |  |
| 52 | Using two special right triangles |  | B.1.h |  |  |
| 53 | Performing compositions of functions | F.IF.5  F.BF.1 b c+ | C.1.d |  |  |
| 54 | Using linear programming | A.CED.3  Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods. | D.2.b |  |  |
| 55 | Finding probability | S.1C.2 | H.1.c  H.1.d |  |  |
| 56 | Finding angles of rotation | F.TF.8 | G.3.c |  |  |
| 57 | Finding exponential growth and decay |  | G.2.?? |  |  |
| 58 | Completing the square | A.SSE.3  F.IF.8a | E.1.a |  |  |
| 59 | Using fractional exponents |  | G.1.c  G.1.f  G.1.g |  |  |
| Investigation 6 | Derive Quadratic Formula |  | E.1.a |  |  |
| 60 | Omit? |  |  |  |  |
| 61 | Understanding advanced factoring |  | F.1.b |  |  |
| 62 | Using complex numbers | N.CN.1 | C.1.b |  |  |
| 63 | Understanding the unit circle and radian measures | F.TF.1  F.TF.2 | G.3.b  G.3.c |  |  |
| 64 | Using logarithms | F.LE.4 | G.2.b |  |  |
| 65 | Using the quadratic formula | N.CN.7 | E.1.c |  |  |
| 66 | Solving polynomial equations | A.APR.4  Prove polynomial identities and use them to describe numerical relationships. For example, the polynomial identity (x2 +y2)2=(x2-y2)2+(2xy)2 can be used to generate Pythagorean triples.  F.TF.7 c | F.2.a |  |  |
| ~~67~~ | ~~Finding inverse trigonometric functions~~ |  |  |  |  |
| 68 | Finding conditional probability |  | H.1.f |  |  |
| 69 | Simplifying complex expressions | N.CN.2 | C.1.a  C.1.b  C.1.c |  |  |
| 70 | Solving radical equations | A.REI.2 |  |  |  |
| Investigation 7 | Collecting Data | S.IC.5  S.IC.6 |  |  |  |
| 71 | Law of Sines |  | G.3.a |  |  |
| 72 | Using the properties of logarithms | F.LE.4 | G.2.? |  |  |
| 73 | Using sampling | S.1C.1  S.1C.2  S.1C.3  S.1C.4 |  |  |  |
| 74 | Finding the discriminant | A.REI.4 a and b | E.1.b |  |  |
| 75 | Graphing radical functions | F.IF.7 b  Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.\*  b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. |  |  |  |
| 76 | Finding polynomial roots | A.APR.3 | F.2.a  F.2.b |  |  |
| 77 | Omit? |  |  |  |  |
| 78 | Solving quadratic equations II |  | E.1.a  E.1.c  E.1.d |  |  |
| 79 | Understanding piecewise functions | F.IF.7 b  Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.\*  b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. |  |  |  |
| 80 | Finding the normal distribution | S.ID.4  Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.  S.1C.4 |  |  |  |
| 81 | Using natural logarithms | F.LE.4 |  |  |  |
| 82 | Omit? |  |  |  |  |
| 83 | Writing quadratic equations from roots | A.CED.1 | F.2.c |  |  |
| 84 | Solving rational equations | A.REI.2 | B.1.h |  |  |
| 85 | Omit? |  |  |  |  |
| 86 | Omit? |  |  |  |  |
| 87 | Evaluating logarithmic expressions | F.LE.4 | G.2.? |  |  |
| 88 | Solving abstract equations | A.APR.4  Prove polynomial identities and use them to describe numerical relationships. For example, the polynomial identity (x2 +y2)2=(x2-y2)2+(2xy)2 can be used to generate Pythagorean triples.  A.CED. 4 |  |  |  |
| 89 | Omit? |  |  |  |  |
| 90 | Omit? |  |  |  |  |
| 91 | Omit? |  |  |  |  |
| 92 | Finding arithmetic sequences |  | H.2.a  H.2.b  H.2.d |  |  |
| 93 | Solving exponential equations and inequalities | F.LE.4 |  |  |  |
| 94 | Omit? |  |  |  |  |
| 95 | Omit? |  |  |  |  |
| 96 | Omit? |  |  |  |  |
| 97 | Finding geometric sequences | A.SSE.4 | H.2.a  H.2.b  H.2.d |  |  |
| 98 | Omit? |  |  |  |  |
| 99 | Omit? |  |  |  |  |
| 100 | Graphing rational functions |  |  |  |  |
| 101 | Omit? |  |  |  |  |
| 102 | Solving logarithmic equations and inequalities | F.LE.4 |  |  |  |
| 103 | Omit? |  |  |  |  |
| 104 | Omit? |  |  |  |  |
| 105 | Finding arithmetic series |  | H.2.c  H.2.e |  |  |
| 106 | Omit? |  |  |  |  |
| 107 | Omit? |  |  |  |  |
| 108 | Using fundamental trigonometric identities | F.TF.5  F.TF.8 |  |  |  |
| 109 | Omit? |  |  |  |  |
| 110 | Graphing logarithmic functions | F.IF.7e  Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.\*  e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. |  |  |  |
| 111 | Omit? |  |  |  |  |
| 112 | Omit? |  |  |  |  |
| 113 | Using geometric series | A.SSE.4 | H.2.c  H.2.e |  |  |
| 114 | Identifying conic sections |  | E.3.a |  |  |
| 115 | Omit? |  |  |  |  |
| 116 | Omit? |  |  |  |  |
| 117 | Solving systems of nonlinear equations |  | E.2.c |  |  |
| 118 | Omit? |  |  |  |  |
| 119 | Omit? |  |  |  |  |