

# **Knox County Prioritized Mathematics Curriculum**

## **3103 Algebra 2**

**2006-2007**

### **Pacing Guide**

**Key:**

**C-Compact** - objectives that have been previously taught

**A-Assessed** – objectives assessed by Knox County or the state

**I-Important** - objectives providing enrichment skills or support to subsequent mathematics courses (optional)

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<b>Chapter One Equations and Inequalities</b>		
<b>Number of Days</b>	<b>Vocabulary</b>	<b>Writing Prompts</b>
6	mathematical model, verbal model, algebraic model, compound inequality	Explain the difference between a simple linear inequality and a compound linear inequality.

<b>Day</b>	<b>Section</b>	<b>Key</b>	<b>Knox County Objective</b>	<b>Page Numbers</b>	<b>Suggested Assignment</b>
1			Preliminaries		
2	1.1	C	Use a number line to graph and order real numbers. Identify properties of and use operations with real numbers.	3-10	15-55 odds, 61-63
2	1.2	C	Evaluate algebraic expressions. Simplify algebraic expressions by combining like terms.	11-17	15-89 odds
3	1.3	C	Solve linear equations. Use linear equations to solve real-life problems.	19-24	17-55 odds
3	1.4	A	Rewrite equations with more than one variable. Rewrite common formulas.	26-32	13-41 odds
4	1.5	C	Use a general problem solving plan to solve real-life problems.	33-40	12-21
4	1.6	C	Solve simple inequalities. Solve compound inequalities.	41-47	13-51 odds
5	1.7	A	Solve absolute value equations and inequalities. Use absolute value equations and inequalities to solve real-life problems.	50-56	33-57 odds, 72
6			Review		
7			Chapter 1 Test		

You may want to consider using problems from the mixed review at the end of each section.

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<b>Chapter Two Linear Equations and Functions</b>		
<b>Number of Days</b>	<b>Vocabulary</b>	<b>Writing Prompts</b>
6	relation, function, standard form, direct variation, scatter plot, piecewise function	Is a function always a relation? Is a relation always a function? Explain.

<b>Day</b>	<b>Section</b>	<b>Key</b>	<b>Knox County Objective</b>	<b>Page Numbers</b>	<b>Suggested Assignment</b>
8	2.1	A	Represent relations and functions. Graph and evaluate linear functions.	67 - 74	19-27 odds, 30-32, 35-47 odds
8	2.2	C	Find slopes of lines and classify parallel and perpendicular lines. Use slope to solve real-life problems.	75 - 81	17-49 odds
9	2.3	C	Use the slope-intercept form of a linear equation to graph linear equations. Use the standard form of a linear equation to graph linear equations.	82 - 90	31-53 odds
9	2.4	C	Write linear equations. Write direct variation equations.	91 - 98	15-39 odds, 43-61 odds
10	2.5	A	Use a scatter plot to identify the correlation shown by a set of data. Approximate the best-fitting line for a set of data.	99 - 107	8-14, 19, 21, 24, 25
10	2.6	C	Graph linear inequalities in two variables. Use linear inequalities to solve real-life problems.	108 - 113	19-43 odds
11,12	2.7	A	Represent piecewise functions. Use piecewise functions to model real-life quantities.	114 - 121	13-25 odds, 35, 37, 38
12	2.8	A	Represent absolute value functions. Use absolute value functions to model real-life situations.	122 - 128	19-39 odds
12			Review		
13			Chapter 2 Test		

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<b>Chapter Three Systems of Linear Equations and Inequalities</b>		
<b>Number of Days</b>	<b>Vocabulary</b>	<b>Writing Prompts</b>
5	system, linear combination, linear programming, feasible region, ordered triple, octants	Explain how you can tell whether a system has infinitely many or no solutions without trying to solve the system.

<b>Day</b>	<b>Section</b>	<b>Key</b>	<b>Knox County Objective</b>	<b>Page Numbers</b>	<b>Suggested Assignment</b>
14	3.1	C	Graph and solve systems of linear equations in two variables. Use linear systems to solve real-life problems.	139 - 146	11-51 odds, 55, 57
14	3.2	C	Use algebraic methods to solve linear systems. Use linear systems to model real-life situations.	147 - 155	17-29 odds, 37, 39, 41, 55
15	3.3	C	Graph a system of linear inequalities to find the solutions of the system. Use systems of linear inequalities to solve real-life problems.	156 - 162	13, 15, 17, 23-29 odds, 41, 43, 45, 55
15	3.4	A	Solve linear programming problems. Use linear programming to solve real-life problems.	163 - 169	11-19 odds
16	(3.5)	I	Graph linear equations in three variables and evaluate linear functions of two variables. Use functions of two variables to model real-life situations.	170 – 176	19-31 odds, 41-47 odds
16	3.6	A	Solve systems of linear equations in three variables. Use systems in three variables to model real-life situations.	177 - 184	25-33 odds, 36
17			Review		
18			Chapter 3 Test		

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<b>Chapter Four Matrices and Determinants</b>		
<b>Number of Days</b>	<b>Vocabulary</b>	<b>Writing Prompts</b>
5	dimensions, entries, scalar, determinant, Cramer's Rule, coefficient matrix, identity matrix, inverse matrix, variable matrix, constant matrix	Is multiplication of matrices commutative? Explain your answer.

<b>Day</b>	<b>Section</b>	<b>Key</b>	<b>Knox County Objective</b>	<b>Page Numbers</b>	<b>Suggested Assignment</b>
19	4.1	C	Add and subtract matrices, multiply a matrix by a scalar, and solve matrix equations. Use matrices in real-life situations.	199 - 207	15-37 odds, 38
19	4.2	A	Multiply two matrices. Use matrix multiplication in real-life situations.	208 - 213	11-33 odds, 37, 38
20	4.3	A	Evaluate determinants of 2 x 2 and 3 x 3 matrices. Use Cramer's rule to solve systems of linear equations.	214 - 221	13-35 odds, 37-53 odds, 55, 57
21	4.4	A	Find and use inverse matrices. Use inverse matrices in real-life situations.	222 - 229	21-43 odds
21	4.5	A	Solve systems of linear equations using inverse matrices. Use systems of linear equations to solve real-life problems.	230 - 236	23-39 odds, 40
21	(Exten.)	I	Solve systems of linear equations using elementary row operations on augmented matrices.	237 - 238	
22			Review		
23			Chapter 4 Test		

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<b>Chapter Five Quadratic Functions</b>		
<b>Number of Days</b>	<b>Vocabulary</b>	<b>Writing Prompts</b>
8	parabola, vertex, axis of symmetry, vertex form, radicand, rationalize the denominator, imaginary unit, complex number, complex plane, complex conjugates, complete the square, discriminant, quadratic regression	Explain why complex numbers and radicals come in pairs.

<b>Day</b>	<b>Section</b>	<b>Key</b>	<b>Knox County Objective</b>	<b>Page Numbers</b>	<b>Suggested Assignment</b>
24	5.1	A	Graph quadratic functions. Use quadratic functions to solve real-life problems.	249 - 255	17-49 odds, 51, 52
25	5.2	A	Factor quadratic expressions and solve quadratic equations. Find zeros of quadratic functions.	256 - 263	29-41 odds, 47-53 odds, 57-63 odds, 73-75, 78, 91, 95
25	5.3	A	Solve quadratic equations by finding square roots. Use quadratic equations to solve real-life problems.	264 - 271	19-67 odds
26	5.4	A	Solve quadratic equations with complex solutions and perform operations with complex numbers. Apply complex numbers to fractal geometry.	272 - 280	23, 25, 29-49 odds, 57, 61, 69, 71
27	5.5	A	Solve quadratic equations by completing the square. Fuse completing the square to write quadratic functions in vertex form.	281 - 290	5, 7, 9, 36, 47, 48, 55, 56, 67-70, 73, 75
28	5.6	A	Solve quadratic equations using the quadratic formula. Use the quadratic formula in real-life situations.	291 - 298	33-43 odds, 49-55 odds, 56-58, 78
29	5.7	A	Graph quadratic inequalities in two variables. Solve quadratic inequalities in one variable.	299 - 305	13, 17, 19, 29, 35, 37, 41, 43

29	5.8	A	Write quadratic functions given characteristics of their graph. Use technology to find quadratic models for data.	306 - 312	10-20 evens, 29-35 odds
30			Review		
31			Chapter 5 Test		

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<b>Chapter Six Polynomial and Polynomial Functions</b>		
<b>Number of Days</b>	<b>Vocabulary</b>	<b>Writing Prompts</b>
9	polynomial function, leading coefficient, constant term, degree, standard form, synthetic substitution, end behavior, sum and difference of two cubes, factor by grouping, quadratic form, long division, synthetic division, local maximum and minimum, finite differences	Sketch a graph of a polynomial function with three turning points. What must be true about the degree of the function? Explain your reasoning.

<b>Day</b>	<b>Section</b>	<b>Key</b>	<b>Knox County Objective</b>	<b>Page Numbers</b>	<b>Suggested Assignment</b>
32	6.1	A	Use properties of exponents to evaluate and simplify expressions involving powers. Use exponents and scientific notation to solve real-life problems.	323 - 328	17-47 odds, 48-52
33	6.2	A	Evaluate a polynomial function. Graph a polynomial function.	329 - 337	15-67 odds, 80, 83
34	6.3	A	Add, subtract, and multiply polynomials. Use polynomial operations in real-life problems.	338 - 344	13-59 EOO*, 62-64
35	6.4	A	Factor polynomial expressions. Use factoring to solve polynomial equations.	345 - 351	19-85 EOO*
36	6.5	A	Divide polynomials and relate the result to the remainder theorem and the factor theorem. Use polynomial division in real-life problems.	352 - 358	15-55 EOO*
36	6.6	A	Find the rational zeros of a polynomial function. Use polynomial equations to solve real-life problems.	359 - 365	15-53 EOO*, 63

37	6.7	A	Use the fundamental theorem of algebra to determine the number of zeros of a polynomial function. Use technology to approximate the real zeros of a polynomial function.	366 - 372	15-53 EOO*
37	6.8	A	Analyze the graph of a polynomial function. Use the graph of a polynomial function to answer questions about real-life situations.	373 - 378	13, 16-18, 30, 33, 37-39
38	6.9	I	Use finite differences to determine the degree of a polynomial function that will fit a set of data. Use technology to find polynomial models for real-life data.	379 - 386	17-27 odds, 33, 35, 37
39			Review		
40			Chapter 6 Test		

\*EOO = Every Other Odd

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<b>Chapter Seven Powers, Roots, and Radicals</b>		
<b>Number of Days</b>	<b>Vocabulary</b>	<b>Writing Prompts</b>
8	index, nth root, rational exponent, power function, composition, inverse function, horizontal line test, radical function, radical equations, extraneous solution, measures of central tendency, standard deviation, box and whisker plot, quartiles, measures of dispersion, frequency distribution	Does every function have an inverse that is also a function? Explain your answer.

<b>Day</b>	<b>Section</b>	<b>Key</b>	<b>Knox County Objective</b>	<b>Page Numbers</b>	<b>Suggested Assignment</b>
42	7.1	A	Evaluate the nth roots of real numbers using both radical notation and rational exponent notation. Use nth roots to solve real-life problems.	401 - 406	13-45 odds, 54-57, 65, 67
43	7.2	A	Use properties of rational exponents to evaluate and simplify expressions. Use properties of rational exponents to solve real-life problems.	407 - 414	23-89 EOO*, 90, 91
44	7.3	A	Perform operations with functions including power functions. Use power functions and function operations to solve real-life problems.	415 - 420	13-51 odds
44	7.4	A	Find inverses of linear functions. Find inverses of nonlinear functions.	421 - 430	15-27 odds, 33-35, 42-44, 49-55 odds
45	7.5	A	Graph square root and cube root functions. Use square root and cube root functions to find real-life quantities.	431 - 436	23-29 odds, 32, 35, 40-42
46	7.6	A	Solve equations that contain radicals or rational exponents. Use radical equations to solve real-life problems.	437 - 444	17, 21, 23, 28, 29, 33-47 odds, 52, 53
47	7.7	A	Use measures of central tendency and measures	445 - 454	11, 14, 17, 19, 22, 23, 28

			of dispersion to describe data sets. Use box-and-whisker plots and histograms to represent data graphically.		
48			Review		
49			Chapter 7 Test		

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<b>Chapter Eight Exponential and Logarithmic Functions</b>		
<b>Number of Days</b>	<b>Vocabulary</b>	<b>Writing Prompts</b>
7	exponential function, asymptote, growth and decay, growth factor, decay factor, base e, logarithm, common and natural logs, change of base formula, expand and condense logs, logarithmic equations	Is it possible to express e as a ratio of two integers? Explain.

Day	Section	Key	Knox County Objective	Page Numbers	Suggested Assignment
50	8.1	A	Graph exponential growth functions. Use exponential growth functions to model real-life situations.	465 - 472	13-25 odds, 26, 43-45, 56, 59-61
50	8.2	A	Graph exponential decay functions. Use exponential decay functions to model real-life situations.	473 - 479	11-17 odds, 25, 27, 34, 35
51	8.3	A	Use the number e as the base of exponential functions. Use the natural base e in real life situations.	480 - 485	17-33 odds, 34, 76
52	8.4	A	Evaluate logarithm functions. Graph logarithm functions.	486 - 492	17-39 odds, 49, 51
53	8.5	A	Use properties of logarithms. Use properties of logarithms to solve real-life problems.	493 - 500	15-17, 31-57 odds, 58-61
54	8.6	A	Solve exponential equations. Solve logarithm equations.	501 -508	19, 20, 25-31 odds, 43, 45, 47, 53, 54, 56
55	(8.7)	I	Model data with exponential functions. Model data with power functions.	509 - 516	17, 20, 21, 19, 31
56			Review		
57			Chapter 8 Test		

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<b>Chapter Nine Rational Equations and Functions</b>		
<b>Number of Days</b>	<b>Vocabulary</b>	<b>Writing Prompts</b>
7	constant of variation, inverse and joint variation, rational function, hyperbola, complex fraction	Explain how you know when a rational expression is in simplified form.

Day	Section	Key	Knox County Objective	Page Numbers	Suggested Assignment
58	(9.1)	I	Write and use inverse variation models. Write and use joint variation models.	533 - 539	21-24, 29-47 odds
59	9.2	A	Graph simple rational functions. Use the graph of a rational function to solve real-life problems.	540 - 546	11-39 odds
59	9.3	A	Graph general rational functions. Use the graph of rational functions to solve real-life problems.	547 - 553	11-29 odds, 38
60	9.4	A	Multiply and divide rational expressions. Use rational expressions to model real-life quantities.	554 - 561	17-49 odds
61	9.5	A	Add and subtract rational expressions. Simplify complex fractions.	562 - 567	13-23 odds, 27-45 odds
62	9.6	A	Solve rational equations. Use rational equations to solve real-life problems.	568 - 574	15-49 odds, 58, 59
63			Review		
64			Chapter 9 Test		

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### Chapter Ten Quadratic Relations and Conic Sections

Number of Days	Vocabulary	Writing Prompts
7	distance formula, midpoint formula, focus, directrix, center and radius of a circle, foci, major and minor axes, vertices, co-vertices, transverse axis, eccentricity	Describe how the equation of a circle is related to the Pythagorean Theorem. Include a diagram to illustrate the relationship.

Day	Section	Key	Knox County Objective	Page Numbers	Suggested Assignment
65	10.1	C	Find the distance between two points and find the midpoint of the line segment joining two points. Use the distance and midpoint formulas in real-life situations.	589 - 594	17-49 EOO*
65	10.2 ♥	A	Graph and write equations of parabolas. Use parabolas to solve real-life problems.	595 - 600	39-75 EOO*
66	10.3 ♥	A	Graph and write equations of circles. Use circles to solve real-life problems.	601 - 608	27-75 EOO*
67	10.4 ♥	A	Graph and write equations of ellipses. Use ellipses if real-life situations.	609 - 614	19-67 EOO*
68	10.5 ♥	A	Graph and write equations of hyperbolas. Use hyperbolas to solve real-life problems.	615 - 621	15-18, 19-39 EOO*, 57-63 odds
69	(10.7) ♥	I	Solve systems of quadratic equations. Use quadratic systems to solve real life problems.	632-638	15-21 odds, 46, 47
69	(Ext.)	I	Find the eccentricity of a conic section.	639-640	1-8
70			Review		
71			Chapter 10 Test		
♥	10.6	A	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 using its equation. ♥ Incorporate Section 10.6 with each section.	623-631	13-19 odds, 29-43 odds

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#### Chapter Twelve Probability and Statistics

Number of Days	Vocabulary	Writing Prompts
9	counting principle, permutation, combination, binomial theorem, theoretical and experimental probability, geometric probabilities, compound event, mutually exclusive events, complement, conditional probability, normal distribution	Explain the difference between a permutation and a combination. Describe what it means for two events to be mutually exclusive.

Day	Section	Key	Knox County Objective	Page Numbers	Suggested Assignment
72	12.1	A	Use the fundamental counting principle to count the number of ways an event can happen. Use permutations to count the number of ways an event can happen.	701 - 707	15-22, 23-53 odds, 55, 56
73	12.2	A	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.	708 - 715	18-30, 37-47 odds, 52, 55, 56
74	12.3	A	Find theoretical and experimental probabilities. Find geometric probabilities.	716 - 723	13-33 odds, 39, 40
75	12.4	A	Find probabilities of unions and intersections of two events. Use complements to find the probability of an event.	724 - 729	17-45 odds
76	12.5	A	Find the probability of independent events. Find the probability of dependent events.	730 - 737	13-23 odds
77	(12.6)	I	Find binomial probabilities and analyze binomial distributions. Test a hypothesis.	738 - 745	11-35 odds
78	12.7	A	Calculate probabilities using normal distributions. Use normal distributions to approximate binomial distributions.	746 - 752	19-31 odds
79			Review		
80			Chapter 12 Test		
81			EOC Review		
82			EOC Exam		